

For Reference

NOT TO BE TAKEN FROM THIS ROOM

Ex LIBRIS
UNIVERSITATIS
ALBERTAENSIS





Digitized by the Internet Archive
in 2022 with funding from
University of Alberta Libraries

<https://archive.org/details/Smith1973>

THE UNIVERSITY OF ALBERTA

RELEASE FORM

NAME OF AUTHOR John Campbell Smith.....
TITLE OF THESIS The Development of Industrial Arts Multiple-Activity in.
Alberta.....
.....
DEGREE FOR WHICH THESIS WAS PRESENTED Master of Education.....
YEAR THIS DEGREE GRANTED Nineteen hundred and seventy-three.....

Permission is hereby granted to THE UNIVERSITY OF ALBERTA
LIBRARY to reproduce single copies of this thesis and to lend or
sell such copies for private, scholarly or scientific research
purposes only.

The author reserves other publication rights, and neither
the thesis nor extensive extracts from it may be printed or
otherwise reproduced without the author's written permission.

THE UNIVERSITY OF ALBERTA

LIBRARY FORM

NAME OF AUTHOR
TITLE OF THESIS
The Department of Industrial Arts Education is
situated at
.....

REMARKS FOR WHICH THIS IS PRESENTED
YEAR THIS THESIS WRITTEN
.....

Permission is hereby granted to THE UNIVERSITY OF ALBERTA
LIBRARY to reproduce single copies of this thesis and to lend or
sell such copies for private, scholarly or scientific research
purposes only.

The author reserves other rights
the thesis not otherwise stated
otherwise reproduced without

DATED *April 25* 197*7*

THE UNIVERSITY OF ALBERTA

The Development of Industrial Arts Multiple-Activity in Alberta

by



John Campbell Smith

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF EDUCATION

DEPARTMENT OF INDUSTRIAL AND VOCATIONAL EDUCATION

EDMONTON, ALBERTA

Spring, 1973

THE UNIVERSITY OF ALBERTA
FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "The Development of Industrial Arts Multiple-Activity in Alberta" submitted by John Campbell Smith in partial fulfillment of the requirements for the degree of Master of Education.

Dedicated to

Bruce, Margaret and Elizabeth

THESIS ABSTRACT

This study was undertaken to examine the development of the Industrial Arts multiple-activity program which has become the generally accepted Industrial Arts program in Alberta.

In order for this to be done, the problem had to be organized into smaller units to describe changes that came about in philosophy, objectives, teacher preparation and facilities. The reasons for these changes and how they were brought about were also examined. An attempt was also made to determine what these changes hold for the future.

Philosophers, such as Luther, Rabelais, Comenius, Rousseau and Dewey, supported studies in the so-called practical subjects, but widespread support for these types of programs was lacking until about the turn of the century, when manual training started to get established. Manual training became manual arts, which in turn became industrial arts when the term was clearly defined by Bonser in 1923. This definition brought about a broad-based program and the general shop concept from which the multiple-activity organizational scheme sprang.

In Alberta, manual training began about 1900 and general shop was introduced in 1938. Although multiple-activity shops existed in Ohio in 1937, it was not until 1962, when Dr. Henry Ziel arrived at the University of Alberta, that multiple-activity was seriously proposed for Alberta. This proposed program brought widespread change to the industrial arts program in Alberta. A massive change-over from the traditional program to multiple-activity took place during the 1962-1972 decade, mostly under the direction of J. D. Harder, Supervisor of

Industrial Arts for the Alberta Department of Education. During this time of change, new laboratories had to be designed, built and equipped; new objectives had to be established; and curriculum guides revised.

By the 1970-1971 term, a total of 325 laboratories were able to offer multiple-activity industrial arts, which represented 86.9% of the laboratories operating in that year. This indicates the widespread acceptance of the multiple-activity program in Alberta.

ACKNOWLEDGEMENTS

The writer is grateful to each of the many persons who had a part in bringing this study to completion.

Special recognition is given to Professor Donald W. Manuel, Chairman of the Writer's Committee, whose advice and guidance have been most helpful and encouraging. The valuable assistance given by other committee members, Dr. John W. Chalmers and Dr. Darrell R. Le Blanc, is greatly appreciated.

The cooperation, help and encouragement extended by Dr. J. D. Harder, Associate Director of Curriculum, who was formerly High School Inspector in Industrial Education and by Mr. A. A. Day, Industrial Arts Consultant, both with the Alberta Department of Education, is also very much appreciated. A special thank you is extended to Miss Denise Henkelman who undertook the difficult task of typing the manuscript.

The writer finally is indebted to his wife, Elizabeth, whose patience, understanding, encouragement and support contributed immensely to the completion of the study.

TABLE OF CONTENTS

	Page
LIST OF TABLES	x
LIST OF FIGURES AND GRAPHS	xi
 Chapter	
I. INTRODUCTION TO THE PROBLEM	1
PURPOSE OF THE STUDY	3
LIMITATIONS OF THE STUDY	4
BACKGROUND TO THE PROBLEM	4
The Historical Research Method	4
Review of the Literature	9
DATA COLLECTION	14
DEFINITIONS OF TERMS USED	15
II. BACKGROUND HISTORY OF INDUSTRIAL ARTS	18
The Russian System	21
The Sloyd System	22
Manual Training	22
Manual Arts	25
Industrial Arts	26
SUMMARY	39
III. THE ALBERTA SCENE	42
Objectives	90
Content	93
High School Program	96
Junior High Program	103

Chapter	Page
Implementation	104
Junior High Curriculum Guide	108
Stated Objectives	108
Definition	109
Program Organization	110
Personnel Change	111
Methodology	112
Laboratory Design and Organization	113
Financing New Laboratories	116
SUMMARY	119
IV. TEACHER TRAINING	122
Early Teacher Training	122
Manual Training and Industrial Arts Teacher Preparation	123
The Move to Edmonton	133
Summer School	138
Workshops, Seminars, Etc.	139
Multiple-Activity Training	139
SUMMARY	141
V. GROWTH OF THE PROGRAM	143
Student Enrollment	143
Laboratories Offering Multiple-Activity	149
VI. SUMMARY AND CONCLUSIONS	150
SUMMARY	150
Philosophy and Objectives	150
Teacher Preparation	154

Chapter	Page
Facilities	155
Implementation	156
CONCLUSIONS	157
Philosophy and Objectives	157
Teacher Preparation	158
Facilities	160
Implementation	160
BIBLIOGRAPHY	169
APPENDIX	176

LIST OF TABLES

Table	Page
I. Teachers Having I.A. 260 Training	140
II. Geographical Distribution of Teachers Having I.A. 260 Training	141
III. Percent Students Enrolled in I.A.	144
IV. Students Enrolled in I.A.	146
V. Relationship Between Number of I.A. Labs and I.A. Teachers Compared to Total Teachers	147

LIST OF FIGURES AND GRAPHS

Figure	Page
I. An Industrial Arts Program Outlined by William E. Warner in 1934	35
II. A New Concept of the Industrial Arts Program by Henry R. Ziel	85

Graph	Page
I. Number of Laboratories in Operation 1962-1971	148

Chapter I

INTRODUCTION TO THE PROBLEM

Unquestionably, we are living in a period of unprecedented change which is being observed and recorded by competent, trained researchers in nearly every field of human endeavor. Ecologists, who at present seem to have the attention of the public, are focusing on the effect that man has on the natural environment. In the economic field, new emphasis is being placed on the use and misuse of resources, both natural and human. Major changes have occurred and are occurring at an accelerated pace in the social realm. In Canada in the short span of a few decades, we have made the transition from an agricultural society to a technical society; from a rural population to a predominantly urban population; from a largely static society to a highly mobile one. Changes in transportation and communication have drastically shrunk the size of the world to the extent that almost instant information transfer is possible.

Education is no stranger in this world of change. Scarcely twenty-five years ago, a high school education, enjoyed by a minority, was made up almost entirely of academic courses. A command of Latin was thought necessary as a sign of scholarship and almost all students followed the same program. Today, nearly all students go on to high school where, particularly in the large urban composite high schools, students can enroll in a variety of programs and study courses most interesting or useful to them as individuals. As new occupational classifications continue to emerge, each requiring special training and,

indeed, as our society continues to change, the role of the school will also need to be modified.

In the field of industrial education, changes are taking place at a rate similar to those being experienced in other areas of education. In Alberta, many significant changes have taken place. The first attempts at introducing courses of a technical or practical nature in Western Canada occurred while Alberta was part of the Northwest Territories when, according to Rahnell, in the mid 1830's, "the Roman Catholic Church was granted funds to enable it to hire two 'practical arts' teachers, . .

. "¹ From that beginning, efforts have been made to provide education of a practical nature to a proportion at least of Alberta's students. In 1962, the Department of Industrial and Vocational Education was established at the University of Alberta. As a result of the Technical and Vocational Assistance Act of 1960, fifteen new vocational schools were put into operation by September, 1963.² Many new industrial arts laboratories were built and equipped. Most of the technical programs from the 1830's onward were somewhat vocational in nature and were designed to develop manual skills. This emphasis was to change however, in the industrial arts program in the province where it shifted towards an understanding of the organization and processes of modern industry and away from skill development. This marked a radical departure from the

¹Douglas J. Rahnell, "The History of Technical and Vocational Education in Alberta," Industrial Arts and Vocational Education Journal (Edmonton: August, 1971).

²Jacob D. Harder, "The Development of the Industrial Arts Program and Its Present Status in the Province of Alberta" (unpublished Master's thesis, Oregon State University, Corvallis, 1964), p. 2.

earlier programs. With this change, new methods of organizing and presenting material had to be developed which gave rise to the multiple-activity approach in Alberta.

This method of teaching industrial arts is somewhat new in Alberta, being introduced about ten years ago. As can be expected, changes in the program are still being experienced, but it appears that throughout the province, the transition from the old program to multiple-activity has, for the most part, been accomplished.

It is often valuable to look backward in time to determine what changes have been made, why they were made, and what the effects of them have been. This study attempted to trace the development of the multiple-activity program in Alberta by examining the problem historically in order to discover the reasons for changing the program to multiple-activity, the extent of these changes, how they were brought about and their effect on industrial arts instruction in the province.

PURPOSE OF THE STUDY

In order to present a clear picture of the development of the multiple-activity program in Alberta, information was sought to describe the following:

1. Changes that have come about in:
 - a) Philosophy (acceptance of philosophy)
 - b) Objectives
 - c) Teacher Preparation
 - d) Facilities
2. How and why these changes came about

3. What these changes hold for the future

LIMITATIONS OF THE STUDY

Apart from reviewing the origins of the multiple-activity method of teaching industrial arts, the study was limited to junior and senior high school programs within the borders of the province of Alberta. No attempt was made to compare these to other programs elsewhere. In addition, the study was confined to industrial arts, with reference being made to vocational education in the province only when it was seen to influence the industrial arts multiple-activity program. Although the study essentially spanned the period from the mid 1800's until June, 1971, the major emphasis was placed on the last decade. The reasons for emphasizing this period were: (1) multiple-activity was not generally being used in Alberta prior to 1960 and (2) a later cut-off date than June, 1971, was felt to leave too many issues unanswered or undefined.

BACKGROUND TO THE PROBLEM

The Historical Research Method

The type of study conducted was historical in nature. Before embarking on this type of undertaking, it was felt that some investigation should be conducted into the preparation and presentation of historical material as an acceptable form of research.

Educators, according to Van Dalen, use three methods of research, being the historical, descriptive and experimental methods.³ Of these,

³Deobold B. Van Dalen, Understanding Educational Research, An Introduction, enlarged/revised (New York: McGraw-Hill Book Company, 1966), p. 176.

the experimental method is often preferred because, ideally, the variables can be controlled and the study replicated. There is a direct, identifiable, causal relationship and accurate prediction becomes possible.

Unfortunately, historical research may lack the precision of the experimental method and in the past has not always been very rigorous nor accurate as some of the writers " . . . sought to achieve literary rather than scientific objectives."⁴ However, this criticism is becoming less prevalent with modern historical research being " . . . a critical search for truth."⁵ Another criticism is that history cannot be replicated.

Travers stated that "every area of human endeavor can benefit from the study of its own history, but historical studies probably have special value in education where the latest innovation is all too often only the revival of a long discarded idea."⁶

In his book, The Science of Educational Research, Mouly claimed:

⁴Ibid.

⁵Ibid., p. 177.

⁶Robert M. W. Travers, An Introduction to Educational Research, 3d ed. (New York: The Macmillan Company, 1969), p. 57.

The purposes for which historical research is undertaken are probably as varied as the many individuals who engage in the activity. They can, however, be summarized into two major categories:

1. The foremost purpose in doing historical research is to gain a clear perspective of the present.
2. . . . the desire of the scientist to arrive at an accurate account of the past . . . the historian would conceive his primary responsibility as a scientist to be the interpretation of the data in order to link the past to the present and the future.⁷

Mouly further defends historical research by saying " . . . a survey of the past can frequently provide valuable insights into present practices and education might profit from a re-evaluation of its present reluctance to sponsor historical research for a thesis or dissertation purposes."⁸

In his quest for truth, the historical researcher employs techniques common to all research. In addition, the nature of the research presents some peculiar problems requiring special techniques and standards.

In general the historian becomes involved in the following procedures: (1) formulating the problem, (2) collecting source materials, (3) criticizing source materials, (4) formulating hypothesis to explain events or conditions, and (5) interpreting and reporting the findings.⁹

Problem formulation is usually preceded by some uncertainty which raises questions in the researcher's mind and the researcher " . . . isolates one by one the crucial points that are giving rise to the

⁷George L. Mouly, The Science of Educational Research (New York: Van Nostrand Reinhold Company, 1970), pp. 209-210.

⁸Ibid.

⁹Van Dalen, op. cit., p. 177.

uncertainty, and then formulates a simple, clear, complete description of the problem."¹⁰

When working on a historical study, the researcher attempts to obtain the most accurate data available, desiring to obtain evidence from primary sources whenever possible. Among primary sources are the testimonies of reliable eye and ear witnesses to the events and actual objects used in the past which even then are open to criticism because of personal bias. When these are not available, he must turn to other sources attempting to gather information from the most reliable source.

Among these sources are:

1. Official records such as legal documents, minutes of meetings, reports of committees, annual reports, attendance records, etc.
2. Personal records including diaries, autobiographies, original drafts of speeches, articles and books.
3. Oral traditions such as myths, folk tales, eyewitness reminiscences.
4. Pictorial records comprising photographs, movies, microfilms, painting and sculpture.
5. Published materials including newspaper accounts, pamphlets, periodical articles, literary and philosophical works.
6. Mechanical records such as tape recordings of interviews, meetings, or speeches including video-tapes.

¹⁰Van Dalen, op. cit., p. 178.

7. Physical remains of buildings, facilities, furniture, costumes, equipment implements, awards and skeletal remains.
8. Printed material including textbooks, record blanks, contracts, attendance forms, report cards and newspaper advertisements.
9. Handwritten materials - notes, drawings, manuscripts and exercises.

After locating source materials, the researcher must perform external and internal criticisms of them. External criticism is used to " . . . determine the time, place, and authorship of the document . . . while internal criticism is concerned with ascertaining the meaning and trustworthiness of the data within the document."¹¹

Van Dalen suggests that formulating a hypothesis is an important and essential part of the historian's task.

To produce works of value, they formulate tentative hypotheses that explain the occurrence of events and conditions. They seek the hidden connections, underlying patterns, or general principles that explain or describe the structural interrelations of the phenomena under study.¹²

Wiersma, on the other hand, feels that it is not necessary to proceed from a stated hypothesis as hypotheses are " . . . not ends in themselves but rather aids to the research process."¹³ One objection that he has to hypotheses is that:

¹¹Van Dalen, op. cit., p. 184.

¹²Ibid., p. 192.

¹³William Wiersma, Research Methods in Education, An Introduction (Philadelphia, New York: J. B. Lippincott Company, 1969), p. 20.

. . . hypotheses bias the researcher in favor of certain conclusions and hence threaten his objectivity. Closely allied to this is the objection that in his pursuit of the stated hypothesis the researcher overlooks other possibly worthwhile hypotheses.¹⁴

Mouly tends to support this view by stating that:

. . . at all times, the historian must operate inductively, i.e., rather than starting with a hypothesis and then marshalling the facts to support it, he must rely on deduction only to check the plausibility of his hypothesis on tentative generalization.¹⁵

It is noted that the latter two writers do not advocate abandoning the use of hypotheses but would rather see them used as research tools quite late in the study.

Finally, the results of the study have to be reported in a scholarly fashion as:

. . . the historian's goal . . . is not only to establish facts, but also to determine trends which the data may suggest and generalizations which can be derived from the data. His task is one of synthesis and interpretation, rather than mere summation.¹⁶

From the foregoing, it is concluded that historical research can contribute significantly to the fund of knowledge. It should be considered a valuable and legitimate method of inquiry provided that it is conducted with scholarly rigor.

Review of the Literature

In order to become more knowledgeable about the preparation and presentation of historical theses, a number of completed theses of this nature were reviewed.

¹⁴Ibid., p. 30.

¹⁵Ibid., p. 226.

¹⁶Ibid., p. 222.

It was noted that the format and style varied considerably, but in all cases, the period being described was organized chronologically. All but one of these theses identified and delimited the problem to be researched quite carefully. For example, Byrne states the problem of his thesis as follows:

The problem of the study was to examine the historical and constitutional backgrounds of provincial leadership in education and to describe the structure, process and products in planning and controlling instruction for the Province of Alberta as a means of appraising the status of leadership in terms of certain criteria.¹⁷

The theses selected for this type of review covered various topics such as the history of the Alberta Teachers' Association, a history of rural high schools in the province and the history of a rural school jurisdiction. In addition, four studies related to industrial arts were perused.

It is interesting to note that in all of the studies, no formal hypotheses were stated. Most of the studies merely reported past events in their chronological context and made little or no attempt at comparison. Most of them did, however, report on underlying causative factors.

A descriptive study of the industrial arts field was presented by J. D. Harder. He undertook a study which was proposed to do the following:

1. To evaluate and compare the progress made in the Industrial Arts field in the past ten years (1952-1962) by determining:

¹⁷Timothy C. Byrne, "The Historical Development and An Evaluation of Provincial Leadership in the Field of High School Instruction for the Province of Alberta" (unpublished Doctoral thesis, The University of Colorado, Denver, 1956), p. 1.

- a) Expansion in number of shop instructors.
- b) Increase of students in the program.
- c) Number of course areas taught.
- d) Qualifications of teachers.
- e) Time spent in Industrial Arts in the school year.

The results of the study should determine the present status and serve as a guide in helping Industrial Arts find its place in the rapidly expanding field of technical and vocational education in Alberta.

- 2. To make a follow-up study of past high school students from the County of Mountain View to determine the value of the Industrial Arts in the general education program.
- 3. To propose recommendations based on interpretation of the data collected.¹⁸

The study conducted by Harder gave an accurate and comprehensive picture of industrial arts development in Alberta for the decade ending in 1962. A similar study was completed by A. M. K. Perrin¹⁹ in 1951 describing the status of industrial arts in Alberta.

In October, 1962, Frank Simon presented a thesis titled "History of the Alberta Provincial Institute of Technology and Art."²⁰ He traced the development of technical education in Canada from about 1668 through to the founding and development of the Technical Institute in Calgary (later to be called the Southern Alberta Institute of Technology). His

¹⁸Harder, op. cit.

¹⁹A. M. K. Perrin, "The Development of Industrial Arts Education in the Province of Alberta" (unpublished Master's thesis, Oregon State College, Corvallis, 1951).

²⁰Frank Simon, "History of the Alberta Provincial Institute of Technology and Art" (unpublished Master's thesis, University of Alberta, Calgary, 1962).

study was carefully conducted and documented. The emphasis, however, was placed on vocational education rather than industrial arts and was most specifically directed at the Institute of Technology and Art.

Gallagher²¹ included a historical outline describing the development of industrial arts including descriptions of the Russian system, the Sloyd system and their subsequent development through manual training and manual arts. He also described changes in philosophy through the years, illustrating the trend away from manual skill development to a general understanding of the industrial world.

Driedger²² conducted a study which compared the industrial arts program in Saskatchewan to four other industrial arts programs or projects in operation in North America. The study is not historical and is of marginal value for this study except that one of the programs described is the University of Alberta's program for training industrial arts teachers, a program that needed to be examined for this study.

In Schools of the Foothills Province,²³ Chalmers included a chapter called "From Industrial Arts to Vocational Education." In this chapter, he reviews the history of technical education in Canada from 1668 to 1964. It is a brief, historical outline of the development of trade training in high schools and the Alberta Industrial Arts program was not covered to any appreciable extent.

²¹James E. Gallagher, "A Descriptive Analysis of Industrial Arts in Alberta" (unpublished Master's thesis, University of Alberta, Edmonton, 1963).

²²Peter P. Driedger, "A Comparison of the Industrial Arts Program of Saskatchewan to Four Other Industrial Arts Programs" (unpublished Master's thesis, University of Alberta, Edmonton).

²³John W. Chalmers, Schools of the Foothills Province (Toronto: University of Toronto Press, 1967).

Chapter I of Teaching Multiple Activities in Industrial Education²⁴ is devoted to the history and development of general shops. The authors refer to principles advocated by Comenius (1592-1670), Pestalozzi (1746-1827) and Froebel (1783-1852) as well as the Sloyd and Russian Systems as forerunners to industrial programs in American schools. Industrial Arts evolved from manual arts, which in turn developed from manual training. The term industrial arts was defined by Bonser and Mossman between 1909 and 1911, although Charles Richards had proposed the term in 1904. The industrial arts general shop took form between 1906 and 1917, and much credit for its development is given to Bonser and his colleagues who established the first general shop at State Teachers College, Macomb, Illinois in 1906. It is interesting to note that "It was here that Bonser experimented with rotating groups of students through experiences in shop, drafting and home economics."²⁵

It is noted that this study differs from the other Alberta studies in two ways. Firstly, it attempts to explain how a specific program evolved and developed. In order to do so, it was necessary to examine its origin and trace its development. As a result, the study was strongly slanted toward philosophical considerations.

The other studies did not take this approach. Perrin's thesis, although historical in nature, tended to describe industrial arts in Alberta without searching for a philosophical base. Gallagher's thesis

²⁴G. Harold Silvius and Estell H. Curry, Teaching Multiple Activities in Industrial Education (Bloomington, Illinois: McKnight and McKnight Publishing Company, 1956).

²⁵Ibid., p. 11.

included a historical sketch, but its main thrust was the evaluation of an existing program. Harder's study described the growth of the program and its status in 1962.

Secondly, the time period emphasized in the various studies was different. Perrin's study ended in 1951, Gallagher's in 1962 and Harder's in 1962. The present study continues through until the summer of 1971.

DATA COLLECTION

The collection of data and information for this study proved to be both interesting and, at times, frustrating. Chapter I, "Background History of Industrial Arts," was written using traditional library research materials such as books, periodical articles, theses and published papers. In Chapter II, "The Alberta Scene," additional courses of information were utilized. Among these were minutes of meetings, newspaper articles, annual reports, newsletters, correspondence, other documents and Department of Education publications as well as personal interviews.

Chapter III, "Teacher Training," was developed by using library research, papers, correspondence, calendars, Department of Education publications, teacher and student lists and personal interviews. Chapter IV, "Growth of the Program," was mainly based on data obtained from Department of Education records.

Although personal interviews rank high as source material for historical studies, some difficulty was experienced in the accurate establishment of some details. This was particularly so in the attempt

to discover how and why the decision was made to move industrial arts teacher training from Calgary to Edmonton. Interviews held with some of the people involved failed to establish the sought-after evidence, as memories of certain incidents were somewhat vague. Fortunately, however, minutes of crucial meetings were uncovered and documentation of the decisions made was established. The personal interview technique was used with considerable success in other areas of the research. When possible, verification was sought from additional sources.

The most valuable research tool proved to be perseverance.

DEFINITIONS OF TERMS USED

The meaning of some words change over a period of time and words dealing with a specific subject matter often have a meaning that is not generally associated with them in the course of everyday language usage. The terminology used in this paper was for the most part the same as used in contemporary literature.

Manual Training - An obsolete type of school shop activity usually restricted to fixed exercises in woodwork, metalwork, and mechanical drawing. Strong emphasis was placed on exercises where common hand tools were used to develop manual skills. The program was based on the theory of transfer of learning. This term eventually gave way to manual arts which in turn was displaced by industrial arts.²⁶ Johnson and Fenn stated it "... was basic to all trades and yet was not specific trade training."²⁷

²⁶G. Harold Silvius and Estell H. Curry, Managing Multiple Activities in Industrial Arts (Bloomington, Illinois: McKnight and McKnight Publishing Company, 1971), p. 593.

²⁷William H. Johnson and Isadore M. Fenn, Fundamentals of Industrial Arts and Vocational Education (Chicago: Goodheart-Willcox, Inc., 1943), p. 9.

Manual Arts - Used to describe an early program (now considered obsolete) of instructional shopwork involving design and hand construction in various mediums for the purpose of developing art appreciation and manual skills.²⁸

Industrial Arts - Industrial Arts is instructional shopwork of a non-vocational type which provided general education experiences centered around the industrial and technical aspects of life today and offers orientation in the areas of appreciation, production, consumption, and recreation through actual experiences with materials and goods. It also serves as exploratory experiences which are helpful in the choice of a vocation.²⁹

Vocational Education - A specialized educational program: (1) to assist persons in securing the skills, information, attitudes, and understandings that enable them to enter employment in a given occupation or field of work; (2) to assist persons in making advancement in their occupation; and (3) to retrain adult workers whose skills are no longer of value, or are inadequate due to technological advancements in industry.³⁰

Industrial Education - A generic term used in referring to industrial training, vocational-industrial education, industrial arts, technical education, apprenticeship, and the offerings of private trade schools. It is concerned with all education which has been adapted to meet the needs of industrial technology, and to interpret industry.³¹

General Shop - (1) A room that has been so equipped and organized that students may participate in various activities and have experiences with a variety of tools, equipment and materials; (2) a shop in which two or more major activities, such as woodworking and metalworking are organized and carried on concurrently under the direction of one teacher.³²

²⁸ Silvius and Curry, Managing Multiple Activities in Industrial Arts, op. cit., p. 593.

²⁹ American Council of Industrial Arts Supervisors, Industrial Arts Education (Millersville, Pa.: American Industrial Arts Association, Inc., 1963), p. 15.

³⁰ Silvius and Curry, Managing Multiple Activities in Industrial Arts, op. cit., p. 600.

³¹ Ibid.

³² Silvius and Curry, Teaching Multiple Activities in Industrial Education, op. cit., p. 460.

Multiple-Activity Laboratory - A laboratory where three or more activities are in progress at the same time.³³

Field of Study - Field is the general title given to the basic technologies represented, e.g., materials, electronics.³⁴

Unit - A unit consists of from nine to twelve weeks of work in a field. There may be several units to complete a field, e.g., woods, metals, plastics, earths in the materials field.³⁵

Predesigned Products - Students at the junior high school level may not have the background or knowledge of tools and materials to design their own products. The teacher should exercise care in the designing of projects to best meet the objectives of the course.³⁶

Sequential Pictorial Instruction Books - S.P.I. books provide a sequence of pictures that illustrate the sequential procedures to be followed in performing a specific operation or process.³⁷

³³ Department of Education, Junior High School Curriculum Guide for Industrial Arts (Edmonton: 1969), p. 3.

³⁴ Ibid.

³⁵ Ibid.

³⁶ Ibid.

³⁷ Ibid.

Chapter II

BACKGROUND HISTORY OF INDUSTRIAL ARTS

Although the term Industrial Arts was not generally established until 1904 by Charles Richards,¹ the roots of the subject matter, sometimes regarded as practical education, are as old as those in any field of education. The earliest forms of practical education can be found in any primitive society where the young are taught to hunt, harvest, build, weave, and, in general, to survive. However, the idea that children should learn things of a practical nature as well as academic subjects has a shorter history. Charles A. Bennett quotes Martin Luther (1483-1546) as saying:

My opinion is that we must send boys and girls to school one or two hours a day, and then have them learn a trade at home for the rest of the time. It is desirable that these two occupations march side by side.²

Rabelais (1495-1553) felt that students should have the opportunity to learn about various trades and handicrafts:

They went likewise to see the drawing of metals, or the casting of great ordinance; how the lapidaries did work, as also the goldsmiths and the cutters of precious stones. Nor did they omit to visit the alchemists, money coiners, upholsterers, weavers, velvet workers, watchmakers, looking glass framers, printers, organists and other kinds of artificers . . . and did learn and consider industry and invention of trade.³

¹James E. Gallagher, "A Descriptive Analysis of Industrial Arts In Alberta" (unpublished Master's thesis, University of Alberta, Edmonton, Alberta, 1963), p. 34.

²Charles A. Bennett, History of Manual and Industrial Education Up to 1870 (Peoria: The Manual Arts Press, 1926), p. 31.

³Ibid., p. 33.

Comenius (1592-1670), often called the father of modern pedagogy, concurred that students should " . . . learn the most important principles of the mechanical arts, both that they may not be too ignorant of what goes on in the world around them, and that any special inclination towards things of this kind may assent itself with greater ease later on."⁴ It should not be concluded that Comenius advocated shopwork in the schools, but only that students should learn about the mechanical arts.

Rousseau (1712-1778), according to Bennett, stated:

If instead of making a child stick to his books I employ him in a workshop his hands labor to the profit of his mind, he becomes a philosopher but fancies he is only a workman.⁵

This philosophy of Rousseau's may mark the beginning of the idea that working with the hands can aid mental training. This may have been a major turning point in educational thought.

Basedow and Campe attempted to apply Rousseau's principles in experimental schools, as did Christian Salzmann (1741-1811). Salzmann established a highly regarded school for sons of people belonging to the higher classes.

Following the ideas of Rousseau and Basedow, he placed emphasis on physical training and on manual work, but he was saner and more practical. Pupils were given instruction in paper work, carpentry, basket-making and turning by specialty trained teachers in each subject, not by mere artisans.⁶

⁴Ibid., p. 38.

⁵Ibid., p. 80.

⁶Ibid., p. 85.

Experimental schools, attempting to relate industrial occupations and academic subjects, were established at various centres. For example, schools of industry were established in England. " . . . New Forest in Hampshire; in 1796 one was established at Lewisham in Kent and there are records of others at Kendal, Birmingham, Cheltenham, Chester and elsewhere."⁷ In these schools, only about one hour per day was spent at reading and writing, the remainder being spent at industry.

The school founded by Pestalozzi (1746-1827), although not financially successful, did achieve a measure of pedagogical success and as a result of his efforts, he has often been referred to as the father of manual training.

Despite the work of these early educators and philosophers, instruction in industrial education was not very prevalent, with most attempts either failing or dying out in a short period of time. Hence, although the ideas of industrial education were expressed and some experimental programs developed, widespread acceptance of this type of education did not materialize until the industrial revolution. Programs developed during the nineteenth and early twentieth centuries seemed to have considerable impact for industrial arts. Gallagher notes that "The literature generally agreed that four types of programs have influenced industrial arts theory and practice."⁸ These were: the Russian system of technical training, the Sloyd system, manual training and manual arts.

⁷Ibid., p. 89.

⁸Gallagher, op. cit., p. 31.

The Russian System

Prior to the development of the Russian system, the prevailing method of learning a skill was by imitation. Bennett claims that " . . . there seems to be no available evidence that any adequate analysis of the mechanic arts was made until 1868 when the Russian system of workshop instruction was devised by Della Vos and his associates for use in the Imperial Technical Schools at Moscow."⁹ With the development of the analysis process, workshop processes could be broken down into fundamental procedures, which could be arranged into a graduated series and " . . . it was recognized that these arts could be taught in schools by essentially the same teaching methods as the other school subjects."¹⁰

The Russian system enjoyed considerable success, so much so that in 1873 it was displayed at the Exposition in Vienna and again in Philadelphia in 1876. A result of this latter presentation, according to Bennett:

. . . was the opening of the schools of Mechanic Arts in connection with the Massachusetts Institute of Technology in Boston and the adoption of the principles of the system by the St. Louis Manual Training School of Washington University. These schools gave it an impulse which spread over the United States, resulting in the movement to establish manual-training high schools, and even echoed back over the ocean to England.¹¹

⁹ Charles A. Bennett, History of Manual and Industrial Education 1870 to 1917 (Peoria: The Manual Arts Press, 1937), p. 14.

¹⁰ Ibid., p. 13.

¹¹ Ibid., p. 42.

The Sloyd System

The Sloyd system, originating in Germany, started as home handwork, mostly undertaken in the evenings. It quickly spread to the Scandinavian countries where it enjoyed its fullest development. By 1844, instruction in handwork skills was being undertaken in a number of Sloyd schools which had become numerous throughout Sweden and Norway.

One of the major developers of the Sloyd system was Otto Salomon, who developed the following aims:

1. To instill a love for and a love of labor in general.
2. To instill respect for rough, honest, bodily labor.
3. To develop independence and self reliance.
4. To train in habits of order exactness, cleanliness, and neatness.
5. To train the eye and sense of form; to cultivate dexterity of hand and develop touch.
6. To cultivate habits of attention, industry, perserverance, and patience.
7. To promote the development of the physical powers.¹²

The above represents the formative aims to which were added the utilitarian aims of (1) directly giving dexterity in the use of tools and (2) executing exact work.

Manual Training

During the latter half of the nineteenth century, a considerable amount of manual training was being conducted in Europe and England, with

¹²Ibid., pp. 67-68.

various types of organization schemes. Sir John Lubbock (1834-1913) stated in 1886:

The introduction of manual work in our schools is important, not merely from the advantage which would result to health, not merely from the training of the hand as an instrument, but also from its effect on the mind itself.

There have been two very different points of view from which manual instruction has been recommended. The first looks at the problem from a specially economical point of view . . .

The second theory regards the manual instruction as a form of education; the object is to give to the hand, not so much a special as a general aptitude . . . The one treats in the school as a subordinate to the workshop and makes it part of the school. The one seeks to make a workman, the other to train up a man.¹³

In the United States, where general elementary education was provided by the state, problems involving secondary, professional and industrial education were left " . . . to individual philanthropic, and association effort . . . "¹⁴

One of the first educators to realize that many boys were not receiving adequate manual training was Calvin M. Woodward (1831-1914), of Washington University. Dr. Woodward adopted the Russian system for his manual training program, begun in 1872. He felt that manual training as a feature of higher grades had the following advantages:

1. It keeps boys longer at school.
2. It awakens a lively interest in school and invests dull subjects with new life.
3. It keeps boys out of mischief both in and out of school.
4. It gives boys with strong mechanical aptitudes, but who are

¹³Ibid., p. 239.

¹⁴Ibid., p. 310.

slow of speech, an equal chance with boys with glib tongues and good memories.

5. Manual training stimulates a love for truth, simplicity and intellectual honesty.
6. Correct notions of things, relations, and forces, derived from actual personal experience, go far towards a comprehension of the language employed by others to express their thoughts and experiences.
7. Science and mathematics profit from a better understanding of forms, materials and processes, and from the readiness with which their principles may be derived.
8. It aids one who must choose his occupation.
9. It raises the standard of attainment in mechanical occupations and invests them with new dignity.
10. It enables an employer of labor to better estimate the comparative value of skilled and unskilled labor, and to exercise a higher consideration for the laboring man.
11. It stimulates invention.
12. It increases the bread-winning and homemaking power of the average boy.
13. It adds to the efficiency of school work by making school attractive; by arousing the enthusiasm of pupils; by making the work more intelligible; by making students more manageable.
14. The last fruit . . . is that of intelligent citizenship.¹⁵

One result of Woodward's vision was the establishment of the Manual Training School of Washington University in 1879, from which American manual-training high schools were developed. This type of high school, according to Bennett, " . . . was a popular success from the

¹⁵ Calvin M. Woodward, "The Fruits of Manual Training in Education," Selected Readings in Industrial Arts, eds. R. Miller and L. Smalley (Bloomington, Illinois: McKnight and McKnight Publishing Co., 1963), pp. 22-34.

first. It filled a recognized gap in the American school system; it met a real need."¹⁶

Despite the popularity of this program, it received a fair amount of criticism and stimulated considerable controversy.

Manual trainers themselves, however, began to point out weaknesses in it. Among the criticisms were that manual training was too formal, too rigid and not truly liberal because it confined the pupil to exercises in narrow fields and ignored relationships with the sciences.¹⁷

It was also feared that as the emphasis was toward industrial processes, appreciation of aesthetic design and handicrafts was being neglected. The curriculum for manual training was essentially woodwork, mechanical drawing and metalworking.

Manual Arts

Olson gives much of the credit for the development of manual arts to Charles A. Bennett, who felt that there was need to offer a broader program than that presented by manual training. Olson quotes Bennett as saying in 1919:

A very important result of this development in the industries is the need of men with a wider knowledge of the materials and processes of industry and the principles upon which the processes and the use of the materials rest . . . But this need for a wider knowledge of the principles and processes of industry is not confined to the workers in these producing industries. Every man who would intelligently use the modern conveniences of his own home, or the labor-saving devices and conveniences of business life, must know something of the materials and principles of industry . . .¹⁸

¹⁶Bennett, op. cit., p. 360.

¹⁷Delmar W. Olson, Industrial Arts and Technology (Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1963), p. 3.

¹⁸Ibid., p. 4.

For subject matter, Bennett recommended graphic arts, mechanic arts, plastic arts, textile arts and bookmaking arts.¹⁹

Industrial Arts

The preceding four systems, according to Gallagher, " . . . are the foundations of industrial arts education."²⁰ It should be noted that there was no clear-cut distinction between one program and another and that portions of each program may exist in industrial arts today. In addition, the development of these programs did not necessarily follow a smooth path of evolution, with one following smoothly into the next.

For example, Charles Richards sought a change in emphasis and name in 1904 when he wrote, according to Olson:

Have we not come to the time when a change is urgently needed in the term applied to constructive work in the schools? Is there a manual training teacher in the country who does not increasingly feel the need for a more explicit and dignified title for his professional work? In short, is it not time that the term Manual Training, never fully expressing the meaning of school handiwork, has now come to be thoroughly inadequate and even misleading? . . . In the hope of enlisting consideration and discussion, the writer proposes the term . . . Industrial Art. Such a term indicates a definite field of subject matter. The word Art is inclusive of both the technical and aesthetic elements, and the qualifying work points specifically and comprehensively to the special field of our material.²¹

Fifteen years later in 1919, Bennett wrote The Manual Arts.²² In it, he suggests the following in the selection of subject matter.

¹⁹ Charles A. Bennett, The Manual Arts (Peoria: The Manual Arts Press, 1919), p. 16.

²⁰ Gallagher, op. cit., p. 34.

²¹ Olson, op. cit., pp. 5-6.

²² Bennett, The Manual Arts, pp. 58-66.

1. It is desirable to select subject-matter that has some industrial value at the present time in our own nation or state.
2. For public school instruction it is desirable to select subject-matter from typical common industries rather than from the exceptional and uncommon ones.
3. The selection of subject-matter in any industry should be based on an analysis of that industry. The same is true if the subject-matter is taken from a group of industries.
4. The trade or industry analyzed for the purpose of obtaining elements of subject-matter should be typical and modern.
5. The resulting groups of subject-matter may vary greatly in amount, in time required, in general character, but each must contain some element or elements vital to the subject under instruction and the groups should, as a rule, be arranged in some sequential order.²³

In addition to presenting a method of determining subject matter, Bennett suggested various ways of organizing and presenting it. The two organizational systems he supported were the group method and the factory system. Teaching methods advocated were (1) the imitative method, (2) the discovery method and (3) the inventive method. Throughout the book, Bennett displayed a strong vocational flavor with an emphasis on trade training.

Bonser and Mossman, however, are usually given the credit for the introduction of industrial arts. Dr. Bonser, who was neither an industrial arts teacher nor a tradesman, was able to produce a clear definition of industrial arts in 1923, which has since become a classic.

The industrial arts are those occupations by which changes are made in the forms of materials to increase their values for human usage. As a subject for educative purposes, industrial arts is a

²³Bennett, The Manual Arts, pp. 58-66.

study of the changes made by man in the forms of materials to increase their values, and of the problems of life related to these changes.²⁴

As industrial arts by this definition is concerned with changes in materials, there is no attempt to study agriculture, mining or transportation. Agriculture and mining provide raw materials and do not change their form. Transportation is simply changing the location of materials or products from place to place.

Bonser and Mossman claimed that there were two purposes for studying the industrial arts, being: (1) the vocational purpose and (2) the general education purpose.

In discussing the vocational purpose, the authors noted that in order to develop vocational skills:

. . . one may have to devote from three or four to eight hours a day to practice in its processes for several years. Clearly, such work has no place in the elementary school nor in the early years of the junior high school.²⁵

The general education purposes on the other hand, were non-vocational in nature and skill development was to be relatively insignificant.

To realize its purposes we make no attempt to develop any considerable degree of skill in any of the several industries studied. Productive skill is not included in its purposes as it is in vocational education. The field includes numerous industries, not limiting itself to one industry as in vocational education.

The purposes or outcomes of the general study are realized in the degree in which it helps one to become efficient in the selec-

²⁴ Frederick G. Bonser and Lois C. Mossman, Industrial Arts for Elementary Schools (New York: The Macmillan Company, 1936), p. 5.

²⁵ Ibid., p. 6.

tion, care, and use of the products of industry, and to become intelligent and humane in the regulation or control of industrial production.²⁶

Under the Russian, Sloyd, Manual Training and Manual Arts systems, skill development was of supreme importance. In addition, these skills were mostly developed in the metal and woodworking fields of trades. As mentioned earlier, Bennett proposed a change to graphic arts, mechanic arts, plastic arts, textile arts and bookmaking arts²⁷ but he still supported the vocational aspect of manual arts.

The more one studies the history of the public schools the more it becomes clear to him that the great purpose of the schools is fundamentally vocational. We are aware of the fact that it is customary to speak of the aim of the public schools as being, first, cultural, and incidentally vocational. From the standpoint of the state, however, the former may be regarded as incidental to the latter.²⁸

Bonser's ideas, however, gained acceptance quite quickly and contributed extensively to the development of industrial arts. Olson quotes Bawden as saying:

If any one factor more than another was responsible for the extent and the quality of Dr. Bonser's influence on the trend of events, it was undoubtedly the crystalization of his ideas into a popular 'definition' of industrial arts. The definition was happily worded, and stirred the imagination of those who were capable of comprehending its implications. With the accompanying interpretation it also created the impression of being based upon sound reasoning and thorough knowledge of the child and of the school.²⁹

²⁶ Ibid., p. 6.

²⁷ Olson, op. cit., p. 3.

²⁸ Bennett, The Manual Arts, p. 47.

²⁹ Olson, op. cit., p. 8.

The change in emphasis resulting from Bonser's work provided the opportunity for the development of the general shop concept which became the most widely accepted industrial arts program in the first half of the twentieth century. Olson quotes Warner as saying:

. . . a first result of the analysis made by Doctors Russell and Bonser and later experimentation carried out under the direction of Dr. Bonser, there was established the present conception of Industrial Arts for public school work . . .

As a second result, there was created a new type of shop known as a general or composite industrial shop or laboratory. This type of shop was designed because it more nearly answered the needs and demands of the new theory of organization . . . Laboratories containing from two to ten activities are most common today . . .³⁰

Along with the change advocated by Bonser, the general shop concept was greatly aided by the creation of the junior high school. Silvius quotes Mays as saying:

. . . it seems clear that originally the general shop was little more than the industrial-education phase of the junior high school movement. The educational theories that brought to birth the junior high school also produced the demand for some kind of program of diversified shop experience for junior high school pupils.³¹

The junior high school and the general shop gained increasing popularity and, according to Silvius:

After World War I the general shop spread rapidly. Often several general shops were built in each of the junior high schools that were being erected in larger cities. In Detroit, for example,

³⁰ D. Snedden and W. Warner, Reconstruction of Industrial Arts Courses (New York: Teachers' College, Columbia University, 1927), cited by Delmar W. Olson, Industrial Arts and Technology (Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1963), p. 10.

³¹ G. Harold Silvius and Estell H. Curry, Teaching Multiple Activities in Industrial Education (Bloomington, Illinois: McKnight and McKnight Publishing Co., 1956), p. 8.

provisions were being made for the following multiple activity programs: household mechanics, general woodworking, general metal-working, printing and general drafting.³²

A government report for 1924-1926 showed that " . . . forty percent of the fifteen hundred schools reporting has inaugurated a general shop; one fourth of those with the general shop has established them during this two year period."³³

Although the general shop increased in popularity, a standardized curriculum was not generally accepted. Some educators tended to lean towards manual training and emphasized hand skill development, others were more or less industry oriented and stressed machine processes. One result of this was that distinctions between manual training, manual arts and industrial arts became less clearly identified and terminology became somewhat confused.

The industrial arts profession attempted to clear up some of this confusion by producing, in 1933, a bulletin entitled "The Terminological Investigation." The following extract from this bulletin, as quoted by Olson, appears below:

The Investigation had not progressed far when it became evident that the reasons why people first used certain professional terms might serve to clear the situation. It was further conceived that there might be a possible relationship between the meanings back of these terms as they were first used, all of which would bear scrutiny and comparison. Accordingly, the present analysis is submitted for inspection as one approach to the scientific study of terms. The research techniques involved are historical and comparative.

³²Ibid., p. 16.

³³Ibid., p. 18.

<u>Manual Training</u>	<u>Manual Arts</u>	<u>Industrial Arts</u>
Inception: 1876	1896	1910
Influence: Della Vos, Runkle, Woodward	Bennett, Salomon, Griffith	Bonsér, Dewey, Bigelow
Skill: Artisan basis, tool mastery	Craft basis, 'Technics'	Individual basis, 'Development'
Methods: Dictated exercises	Assignment of useful artistic projects	Projects and indi- vidual creativity
Content largely: Work in wood; Mechanical drawing	Arts: Graphic, Plastic, Textile, Mechanic, Bookmaking	Any representation of modern industry conditioned by stated objectives
End functioning: In itself	Avocational, nice to have done, development of appreciation for the Crafts	Exploration, Devel- opment of Personal- social Traits, Guidance, Consumer Education
Basis of Truth: Authority	Authority and Custom	Scientific evidence and Criteria
Centers in Teacher	Centers in Project	Centers in Pupil
Unit-Shop	Unit or General Shop	Laboratory of In- dustries or Unit-Shop ³⁴

"The Terminological Investigation" produced the following defini-
tion for industrial arts:

Industrial Arts is one of the Practical Arts, a form of general or non-vocational education, which provides learners with experiences, understandings, and appreciations of materials, tools, processes, products, and of the vocational conditions and requirements incident generally to the manufacturing and mechanical industries.

The results are achieved through design and construction of use-
ful products in laboratories or shops, appropriately staffed and
equipped, supplemented by readings, investigations, discussions,

³⁴Olson, op. cit., p. 12.

films, visits, reports, and similar activities characteristic of youthful interests and aptitudes in things industrial.

The subject of Industrial Arts belongs peculiarly within junior and senior high school areas for such purposes as exploration, guidance, the development of avocational and vocational interests and aptitudes, specific manual abilities, desirable personal-social traits growing out of industrial experiences, ability to choose and use industrial products wisely, all coupled with the aesthetic relationships involved. In general, its purposes are educationally social rather than vocationally economic, although in the senior high school it may increasingly emphasize vocational objectives in a non-legal sense, for certain students.

Industrial Arts includes such industrial representations as drawing and design, metal work, wood work, textiles, printing, ceramics, automotives, foods, electricity, and similar units, either as separate offerings or in various combinations common to the 'General Shop' or 'Laboratory of Industries.'

The term laboratory is more appropriate when the offering is provided upon an experimental or developmental basis, as is commonly done in the junior high school; and the term shop may be more appropriate where the work is carried on rather upon the production or economic basis, as may be done in the senior high school.

The term Industrial Arts is generally displacing the historical but narrower term Manual Training; and in common usage it has substantially the same significance as the term Manual Arts; although Industrial Arts emphasizes in addition the all-round arts of industry rather than just manipulative or 'manual' aspects of artistic construction implied in the term Manual Arts.³⁵

Olson claims that this historic definition has " . . . influenced the development of industrial arts programs since 1933. It appears to have been the first such professional pronouncement to follow Bonser's famous definition."³⁶

Since 1933, a considerable number of industrial arts programs have been proposed and curriculum plans presented, but in the majority of

³⁵ Ibid., p. 13.

³⁶ Ibid.

cases, they have revolved around the general shop concept, with one of the major conflicts being the balance between breadth and depth.

William E. Warner in 1934 proposed that Industrial Arts should be made very flexible and broad enough to teach " . . . the multitude of technical things about industry which everyone should know."³⁷ He also suggested that many desirable personal-social traits could be acquired and developed in the school shop setting.

For subject matter, he noted that:

Nothing is without a plan in the world. This suggests drawing, sketching and duplicating and involves both study and investigation to learn what is best for one to do. The world's great industries work with different woods, metals, clays, foods, textiles and the like. Electricity is one of our greatest forces and is therefore significant for study in the modern school. 'Automotives' when interpreted as referring to any self propelled machine, includes a consideration of all kinds of transportation. All of these would be for naught, however, without the graphic arts, commonly referred to as printing.³⁸

He illustrated his concept of Industrial Arts with the diagram following in Figure 1.

³⁷William E. Warner, "A Perspective of Industrial Arts," American School Board Journal, 89:12, August, 1934, p. 12.

³⁸Ibid.

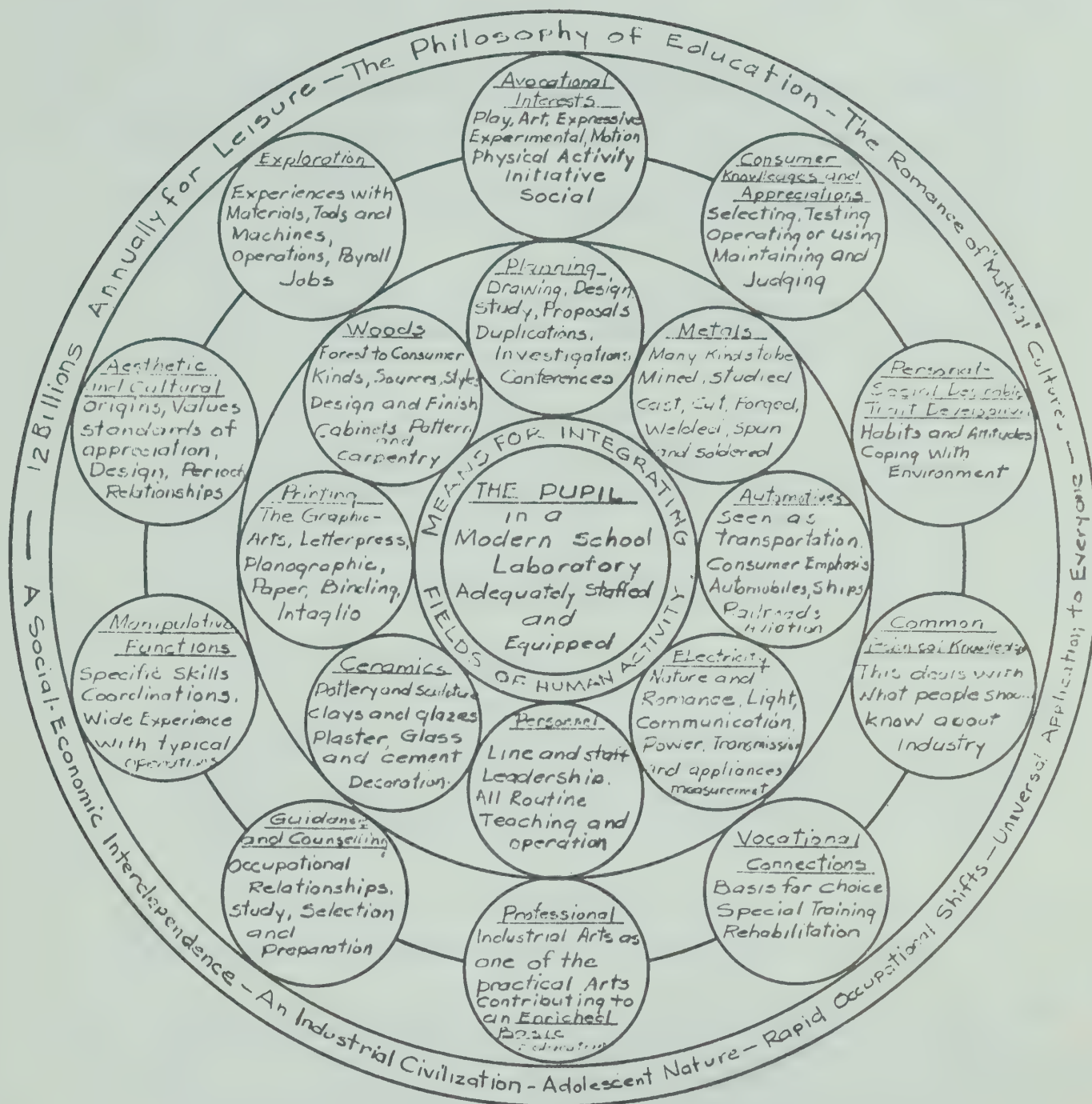


FIGURE I

An Industrial Arts Program Outlined by William E. Warner in 1934.

Support for the inclusion of industrial studies in the school curriculum came from different sources, not the least of which was John Dewey. In his publication, The School and Society, first published in 1899, Dewey said:

When we turn to the school, we find that one of the most striking tendencies at present is the introduction of so-called manual training, shopwork and the household arts - sewing and cooking.

This has not been done 'on purpose,' with a full consciousness that the school must supply that factor of training formerly taken care of in the home, but rather by instinct, by experimenting and finding that such work takes a vital hold of pupils and gives them something which was not to be got in any other way. Consciousness of its real import is still so weak that the work is often done in a half-hearted, confused and unrelated way. The reasons assigned to justify it are painfully inadequate or sometimes even positively wrong.

If we were to cross-examine even those who are most favorably disposed to the introduction of this work into our school system, we should, I imagine, generally find the main reasons to be that such work engages the full spontaneous interest and attention of the children. It keeps them alert and active, instead of passive and receptive; it makes them more useful, more capable, and hence more inclined to be helpful at home; it prepares them to some extent for the practical duties of later life . . . 39

Dewey recognized these as valuable reasons for studying these subjects, but thought they were unnecessarily narrow and said:

We must conceive of them in their social significance, as types of the processes by which society keeps itself going, as agencies for home to the child some of the primal necessities of community life . . . in short, as instrumentalities through which school itself shall be made a genuine form of active community life, instead of a place set apart in which to learn lessons.⁴⁰

³⁹ John Dewey, The Child and the Curriculum and The School and Society (Chicago: The University of Chicago Press, 1956), p. 13.

⁴⁰ Ibid., p. 14.

Johnson and Fenn observed that Dewey emphasized doing rather knowing.

According to Dewey's idea of education, a man may know everything there is to know in the world and still not be educated. Knowledge is a necessary part of education. An individual may do his work better if he has command of certain facts. The true aim of acquiring knowledge is for the sake of doing and not for the sake of merely knowing.⁴¹

In the chapter titled "The Psychology of Occupations," Dewey, after defining occupation as being a mode of activity of the child which parallels some form of work carried on in social life, stressed that this type of activity should not be work which educates primarily for a trade. He cautioned that trade type of work could be carried on in other than trade schools:

. . . so that the entire emphasis falls upon the manual or physical side. In such cases the work is reduced to a mere routine or custom and its educational value is lost. This is the inevitable tendency wherever, in manual training for instance, the mastery of certain tools, or the production of certain objects, is made the primary end, and the child is not given, wherever possible, intellectual responsibility for selecting the materials and instruments that are most fit, and given an opportunity to think out his own model and plan of work, led to perceive his own errors, and find out how to correct them - that is, of course, within the range of his capacities.⁴²

Delmar W. Olson reported on a very interesting program in Industrial Arts which operated in Clinton County, Ohio. The Arts and Industries program, set up in seven rural centralized schools in 1937, replaced the traditional practical arts program in the county, which was

⁴¹William H. Johnson and Isadore M. Fenn, Fundamentals of Industrial Arts and Vocational Education (Chicago: Goodheart-Willcox, Inc., 1943), p. 33.

⁴²Dewey, op. cit., p. 132.

judged to be ineffective. Clinton County, which had been a farming community, was rapidly becoming economically and socially encompassed within an area of the productive and distributive industries. Along with this, farming operations were becoming increasingly mechanized. The industrial arts program was changed to fit into this community. The most interesting feature of this program was the organization of subject matter content and physical layout of the laboratory.

The subject matter " . . . was originally determined on the basis of research largely through the medium of the writer's thesis."⁴³ Olson identified fifteen activity areas to be studied which were:

Foods	Power	Crafts
Textiles	Graphic Arts	Planning
Ceramics	Electrical Communication	Safety
Woods	Transportation	Guidance
Metals	Related Science	Personnel Management

The laboratory was organized into a number of centres or areas. A sixteen-pupil laboratory had forty work stations, while a twenty-nine-pupil laboratory had sixty-one pupil work stations. The larger laboratory was planned around the following areas or centres:

Related Science and Electrical
Photography
Art and Planning
Metal (sheet metal, hot metal, machine shop)
Crafts
Wood
Service
Conference⁴⁴

⁴³ Delmar W. Olson, "A County Arts and Industries Program," Industrial Arts and Vocational Education Magazine, School Shop Annual (Greenwich: March, 1941), p. 121.

⁴⁴ Ibid., p. 129. For a floor layout, see appendix p. 176.

From the layout and description of the laboratory, it is probable that students worked in small groups and many different activities were engaged in at the same time - a process very similar to multiple-activity in Alberta.

SUMMARY

Many of the early educational philosophers such as Luther, Rabelais, Comenius and Rousseau supported studies in practical education. The first programs to enjoy widespread success however, were the Russian and Sloyd systems. The Russian system, developed by Della Vos and his associates in 1868, was based on the premise that industrial processes could be broken down by analysis into fundamental procedures which, in turn, could be taught in schools using regular teaching methods.

The Sloyd system, which had developed from home handiwork undertaken in the evenings, by 1844 had considerable success and was taught in a number of Sloyd schools in Sweden and Norway, although it had originated in Germany.

These two systems were introduced into the United States. Dr. Woodward adopted the Russian system for instruction at the University of Washington, and it was also used at the Massachusetts Institute of Technology in Boston. The program established by Woodward at Washington is given credit for the development of American manual training high schools.

Both the Russian system and the Sloyd system emphasized trade skill development in a few areas and, as a result, received considerable criticism from a large number of manual training teachers. A broader

program which added graphic arts, mechanic arts, textile arts and bookmaking arts to the traditional subjects of woodwork, metalwork and drawing found in manual training was recommended by Bennett. This program became known as Manual Arts.

It was not until 1923 that the term Industrial Arts, first proposed by Richards in 1904, was adequately defined by Bonser. With the new definition, Industrial Arts was able to move away from the vocational orientation and become more closely identified with general education.

With this new emphasis towards general education and the addition of the various fields of study advocated by Bennett, the general shop concept developed in the United States. As early as 1937, the Arts and Industries Program in Ohio was underway. This program was in all probability one of the first to organize an Industrial Arts program on the multiple-activity concept.

The evolution of underlying philosophies and the development of program objectives is particularly relevant to this study. The Russian and Sloyd systems were heavily slanted towards the development of craft and trade skills. By the time Manual Training became general in the United States, the effect that studies of a practical nature had on general education were investigated. Manual Training gave way to Manual Arts, which was based on a broader curriculum and was more closely identified with general education. This movement gained strength with Bonser's definition of Industrial Arts. The type of program instituted by Bonser and Mossman led to the development of the general shop in which the organizational aspects of multiple-activity were born.

It should be noted that apart from industrial courses developed in Russia and Sweden, this portion of the study has concentrated on the evolution, so to speak, of industrial arts in the United States. The reason for this is that it is thought that the American influence has been greater on the development of industrial arts in Alberta than the influence from any other country. The importance of the British influence cannot be disregarded, however, and this aspect of the Alberta scene will be explored in subsequent chapters of this study.

Limitations of the study also prevented investigations into the development of Industrial Arts in other provinces in Canada, although an interesting development was uncovered which took place in Winnipeg in the mid 1930's. The program, under the direction of R. J. Johns, was based on the interrelationships of occupations and brought a number of unit shops together into one general area. (See appendix pp. 177-178.)

Chapter III

THE ALBERTA SCENE

Alberta became a province on September 1, 1905. The Liberal party formed the first elected government of the province and it is noteworthy that the premier, the Honorable A. C. Rutherford, was also the minister of education.

Prior to 1905, the province was part of the Northwest Territories which, as part of Canada, was founded in 1870. Education in the area before 1870 was provided mostly by the Roman Catholic and Protestant missions. As early as 1842, Father Thibault had established a mission at Lac St. Anne. In the 1840's, according to Chalmers, Reverend R. T. Rundle operated a Sunday and day school at Fort Edmonton.¹ In 1860, Father Lacombe taught in a school he founded in Edmonton. In 1883, the Northwest Territorial Council established a board of education and within two months, Edmonton petitioned for the provision of a Protestant public school district which was passed in December, 1884, making it the first school district in Alberta. Calgary became the second, and public supported schools became a reality.

In 1905, when Alberta became a province, it inherited the educational system established in the Northwest Territories and as a heritage received, according to Chalmers, " . . . some 560 school districts from

¹ John W. Chalmers, Schools of the Foothills Province (Toronto: University of Toronto Press, 1967), p. 10.

the North West Territories administration . . . forty more were established by the end of 1905."² In 1906, 28,784³ students attended classes in 628 schools throughout the province.

In many instances, the early missionaries attempted to provide vocational and agricultural skills for the Indians. Despite these efforts, Alberta lagged behind Eastern Canada in the establishment of trade training facilities and programs.

Chalmers reports that about " . . . 1668 Bishop Laval founded a trade school at St. Joachim, New France, for the teaching of courses in carpentry, gilding, tailoring, painting and sculpture."⁴ Simon notes that a " . . . religious order established a somewhat similar school in 1699 with authorization from the King of France."⁵ He also notes that "for many decades following the advent of these schools, however, vocational education fell to individual craftsmen as a result of the instability of colonial life, wars, and the acquisition of French Canada by Britain."⁶

From the middle 1800's until the turn of the century, various vocational programs were attempted in Eastern Canada. For example, by

²Ibid., p. 26.

³Department of Education, Annual Report, 1906 (Edmonton: 1906), p. 12.

⁴Chalmers, op. cit., p. 203.

⁵Department of Labour, Vocational Education in Canada (Ottawa, 1949), p. 11, cited by Frank Simon, "History of the Alberta Provincial Institute of Technology and Art" (unpublished Master's thesis, University of Alberta, Calgary, Alberta, 1962), p. 2.

⁶Ibid., p. 2.

1880, thirteen trade schools had been approved by the Quebec Government.⁷ In 1885, Truro Agricultural College was established and in 1891, manual training in the higher elementary grades had begun in Halifax.⁸

The first major stimulus for industrial education in Canada was provided by the wealthy tobacco manufacturer, Sir William Macdonald. Macdonald was convinced by Professor James Robertson that there was need in Canada for a manual training program. As a result, Macdonald spent " . . . one and one half million dollars on what was this country's first large-scale systematic experiment in vocational education."⁹ Twenty-one Canadian centres were selected for the experiment which was planned and implemented by Dr. Robertson. One of these cities was Calgary.

Robertson, according to Simon, was " . . . convinced that the existing system of formal education in the public schools was uninspiring and inadequate for the bulk of students, whose lifetime work was to be in the manual occupations."¹⁰ In addition to this conviction, Robertson was influenced by a report produced in Ireland by the Viceregal Commission under the direction of the Board of National Education. This report, prepared in 1897, stated:

⁷ Ibid., p. 2.

⁸ Ibid., p. 3.

⁹ Chalmers, op. cit., p. 204.

¹⁰ Frank Simon, "History of the Alberta Provincial Institute of Technology and Art" (unpublished Master's thesis, University of Alberta, Calgary, Alberta, 1962), p. 4.

The present system, which consists largely in the study of books is one-sided in its character; and it leaves some of the most useful faculties of the mind absolutely untrained. We think it important that children should be taught not merely to take in knowledge from books, but to observe with intelligence the material world around them; . . . that they should even at school acquire some skill in the use of hand and eye . . . such a training we regard as valuable to all, but especially valuable to those whose lives are to be mainly devoted to industrial arts and occupations. The great bulk of the pupils attending primary schools under the National Board will have to earn their bread by the work of their hands; it is therefore important that they should be trained, from the beginning, to use their hands with dexterity and intelligence.¹¹

The financing established by Macdonald was used to provide teacher training, salaries, equipment and tools and was invested over a three-year period. Twenty-four teachers were imported from Great Britain, two from the United States and one from Sweden.¹² Summer schools to train Canadian teachers were held in 1900, 1901 and 1902.

At the end of the three-year experimental period, the equipment was turned over to the local school boards. Simon reports that "at the close of the demonstration period over seven thousand boys in public schools and several hundred teachers in training in normal schools were receiving manual training. Everywhere, the experiment was regarded as a success."¹³

The Macdonald Manual Training Plan operated in Calgary was " . . . considered successful and Calgary, who benefited from it during the

¹¹James W. Robertson, "The Macdonald Manual Training Schools," Canadian Magazine, XVI (1901), p. 528, cited by Frank Simon, "The History of the Alberta Provincial Institute of Technology and Art" (unpublished Master's thesis, University of Alberta, Calgary, Alberta, 1962), p. 5.

¹²Simon, op. cit., p. 6.

¹³Ibid., p. 7.

three-year trial period, adopted manual training as a permanent course of studies, from where it quickly spread to other Alberta cities."¹⁴

In the 1903 Annual Report of the North-West Territories Department of Education, a record of the following resolution passed by the Calgary Public School Board in 1902 was made.

Resolved that after almost two years' attendance of our pupils at manual training classes which has fully confirmed our opinion of the very great benefit to be derived from such training we strongly recommend that the subject (provisional course) be placed on the school program of studies, and that the curriculum be so modified as to allow ample time for the teaching of it.¹⁵

Grywalski observed that " . . . in 1907 the school board of Medicine Hat introduced manual training and courses in domestic science."¹⁶

Harder noted that manual training courses were introduced in grades VI, VII and VIII in Edmonton in 1908.¹⁷ At this time the courses " . . . known as manual training were mainly woodworking and

¹⁴ Douglas J. Rahnell, "The History of Technical and Vocational Education in Alberta," Industrial Arts and Vocational Education Journal (Edmonton, Alberta: August, 1971).

¹⁵ North-West Territories, Department of Education, Annual Report (Regina: 1903), p. 52, cited by Frank Simon, "The History of the Alberta Provincial Institute of Technology" (unpublished Master's thesis, University of Alberta, Calgary, Alberta, 1962), p. 12.

¹⁶ Stan Grywalski, "A History of Technical-Vocational Secondary Schools of Alberta" (unpublished Doctoral dissertation, University of Oregon, Eugene, 1972), p. 25.

¹⁷ Jacob D. Harder, "The Development of the Industrial Arts Program and Its Present Status in the Province of Alberta" (unpublished Master's thesis, Oregon State University, Corvallis, 1964), p. 12.

blacksmithing with the primary concern being the development of manual skills."¹⁸

In addition to manual training, efforts to provide vocational training were also made. This aspect of education was critically examined in 1910 by a Royal Commission appointed by the Federal Government to enquire into vocational education.

In the report submitted in 1913, recommendations were made for a complete system of vocational education in the secondary schools supported by all levels of Government. This report provided impetus for the provision of industrial education classes in the secondary school for there was rapid expansion in this regard soon after.¹⁹

Chalmers also recognized the importance of the Commission's work which resulted in the federal Agriculture Assistance Act of 1913.

This particular act provided \$10,000,000 for the provinces in federal aid over a ten-year period for the purposes of promoting agriculture and agricultural development. Alberta used its share for construction and operating expenses of the Olds and Vermillion schools of agriculture.²⁰

While this investigation was under way, Lethbridge " . . . in 1911 was first to erect a manual training school opened in February 1913. Courses offered included commerce, blacksmithing, woodworking and domestic science."²¹ Unfortunately, however, in 1916 as a result of financial difficulties, the program was ended and the staff released.

¹⁸Ibid., p. 12.

¹⁹Ibid., pp. 12-13.

²⁰Chalmers, op. cit., p. 205.

²¹Simon, op. cit., p. 14.

Harder reports that "Edmonton opened a technical high school on October 15, 1913 with 12 students enrolled"²² and in 1916 "Calgary established a secondary school manual training center."²³ Harder also says that:

In the schools which offered practical courses at this time, the emphasis was always on woodwork and metalwork but in addition, courses in household science, sewing and dressmaking were available to girls. In the early stages, the technical courses were superimposed upon the academic curriculum and were taken as extras. In 1921 a special curriculum was developed for the school offering technical subjects which made provision for the following types of training: pre-vocational work for any boy fifteen years of age or over who had finished grade six; vocational work for any boy sixteen years of age or over through a two year trade course; and an academic program for any boy who had finished grade eight and who wished to prepare himself for a college course in engineering. Under such conditions the technical high school enrollments increased. It is recorded that in 1938 the enrollment in Edmonton alone was about 700. Moreover, by this time, 25 centers were offering high school shop courses.²⁴

Public education after 1912 in the province was basically divided into two portions. Elementary school included grades I to VIII, and the high school handled grades IX through XII. In 1926, Manual Arts I and II was included as a course of study for secondary schools.²⁵ Prior to this time, it had been limited almost exclusively to grades VII and VIII.

Manual Arts I included studies in drafting, cabinet work, wood-turning and carpentry. Manual Arts II also included drafting along with

²²Harder, op. cit., p. 13.

²³Ibid.

²⁴Ibid., pp. 13-14.

²⁵Department of Education, Handbook for Secondary Schools, 1927 (Edmonton: 1927), pp. 104-105.

forging, sheet metal and machine shop. There were six different streams in the high school program for the first three years, being: Normal Entrance, Matriculation, Agricultural, Commercial, Technical and General. In the fourth year, these were reduced to Normal Entrance (First Class), Matriculation, Technical and General.²⁶ In addition to Manual Arts, technical courses were available in Woodwork, Metal, Electricity and Motor Mechanics which were offered at special technical high schools.

This program remained essentially unchanged until the 1936-37 school term, when grade IX was removed from the high school program and placed with grades VII and VIII to form the junior high school grades.²⁷

This change from eight years of elementary school and four years of high school to the six-year elementary, three-year intermediate and three-year high school program took place for a number of reasons, some which went back to 1934. In the Annual Report for that year, the Supervisor for Schools, G. F. McNally, announced that committees " . . . now at work on the revision of courses for both elementary and secondary schools are impressed with a need for a new approach both in subject matter and method."²⁸ This committee came to the following conclusions:

- a) That the revised courses must take greater account of the needs of the thousands of young people in the secondary schools who will never go on to higher education;

²⁶Ibid., pp. 3-6.

²⁷Department of Education, Regulations Relating to the Programme of Studies and Annual Examinations for the Year Ending June 30, 1937 (Edmonton: 1936), p. 3.

²⁸Department of Education, Annual Report, 1934 (Edmonton: 1935), p. 13.

- b) that certain worthwhile experiences now more or less neglected must be provided for;
- c) that some way must be found to free the offerings of the small high schools from the overshadowing influence of the Matriculation and Normal Entrance courses;
- d) that the courses included in the new programme must be valuable in their own right, and not because of the deferred values to be expected to accrue to the individuals later as a result of further study;
- e) that there must be such a restriction in the subject matter content as will ensure to the teacher the maximum of freedom in the presentation of his material and at the same time enable the pupil to make adequate assimilation through reflection and collateral readings.²⁹

The committee was formed under the Minister of Education, Perrin Baker. In the 1936 year, while Alberta's new Social Credit premier, William Aberhart also acted as Minister of Education, the committee " . . . decided to make a fundamental change in the organization of the school grades in the province. The committee in 1936 gave official sanction to the adoption of the junior high school principle."³⁰

The junior high school principle referred to made provision for the "intermediate school," which included grades VII, VIII and IX. The name was changed to junior high school in 1949.³¹

The reason for establishing the intermediate school in 1936 was intended to provide " . . . an integrated school unit whose programs

²⁹ Ibid., p. 18.

³⁰ Bernal E. Walker, "Public Secondary Education in Alberta" (unpublished Doctoral dissertation, Stanford University, California, 1955), p. 224.

³¹ Department of Education, Annual Report, 1949 (Edmonton: 1950), p. 39.

would serve the needs and interests of young people emerging into adolescence."³²

A distinctive feature of the new high school program was the introduction of the "credit" system. Along with this system, high school diplomas were to be available to students who earned 100 credits in high school. Chalmers notes that " . . . it was hoped that the status and prestige which attached to the academic route, as compared with the technical or commercial programme, would be obviated, and that students would not attempt, for irrelevant reasons, patterns for which they were unfitted by interest or ability."³³

The introduction of the credit system made it mandatory for students to attend school, as credits were tied to school instructional time, one credit being assigned for thirty-five minutes of instructional time per week.

The movement towards this new system, where all students were required to take a "core" program made up of English, Social Studies, Health and Physical Education, plus electives, brought about the end of the specialist high schools such as the technical high schools and commercial high schools. Calgary, anticipating the change, developed the first composite high school in the province, Western Canada High.

³²Walker, op. cit., p. 224.

³³Chalmers, op. cit., p. 196.

During the same period, many teachers of Manual Training were somewhat critical of the course, as they held the opinion that the program, based largely on woodwork, was too narrow in scope.³⁴

In 1938, Manual Arts became General Shop in Alberta's high schools. With the change in name, a change in emphasis was made which broadened the program.

The essence of the General Shop idea is individuality. Few subjects are more adaptable in catering to individual differences among students. Ideally, if an instructor could be secured, who was versatile enough, each student at the same time might work at a different project, using a different medium. Practically, the projects should be related closely to the student's personal interests, which should be the dominating influence in the choices made, subject to the ability of the student and the limitations of the shop, and always subject to the judgment of the instructor.³⁵

In General Shop I, students were able to receive instruction in Woodwork, Metal, Electricity, Automotives and Farm Mechanics. These same units were available in General Shop II along with Gas Engines and Plastics.³⁶

In the junior high school program during this period, general shop was also included. It was available for grades VII, VIII and IX. One supporter of the general shop concept was Dr. W. G. Carpenter who,

³⁴ Personal interviews held on August 14, 1972 and August 16, 1972 with N. J. Cameron, L. N. Elliott and G. R. Throop verified this. These teachers taught at Drumheller, Coaldale and Calgary respectively. Later they all taught in Calgary.

³⁵ Department of Education, Regulations Relating to the Program of Studies and Annual Examinations for High Schools for the Year Ending June 30, 1939 (Edmonton: 1938), pp. 127-128.

³⁶ Ibid., pp. 128-130.

after serving as Superintendent of Schools in Edmonton for twelve years, followed J. C. Miller³⁷ as Director of Technical Education for the province and as principal of the Provincial Institute of Technology and Art.³⁸

Dr. Carpenter retired from his position as principal in 1941 and was followed by James Fowler. Carpenter left the Supervisor's position in January, 1944 when the provincial responsibilities for the supervision of general shop were taken over by A. P. Tingley.

Tingley, who received some of his training at Fort Collins, Colorado, stated in a paper, prepared between 1941 and 1945, that:

The importance of the dramatic increases in the number of important inventions and discoveries developed since the 'manual training' days makes it impossible for the progressive teacher to hold the ideas prevalent during the days of the old program.³⁹

The objectives that Tingley identified for industrial arts are particularly interesting. He noted that industrial arts provides for avocational interests and explorational experiences. Concerning explorational experiences he said:

Exploration principally involves: contacts with a wide range of materials, experiences with tool and machine manipulation, and study

³⁷Dr. Miller, who was principal of Camrose Normal School, was asked by the Minister of Education, J. R. Boyle, to prepare plans for organization of a Technical School for Calgary and became the first principal of The Institute of Technology and Art and Director of Technical Education in 1914. Tech-Art Record, 1927-28, p. 8.

³⁸Tech-Art Record 1934-35, Yearbook of Provincial Institute of Technology and Art, V (Calgary: 1935), p. 27.

³⁹A. P. Tingley, "A Concept of Industrial Arts and its Significance in a Progressive Educational Program" (High School Inspector - Industrial Education Files, Department of Education, Edmonton), pp. 29-30.

of various industrial occupations. These three essentials of exploration are of course commonly recognized but there are two others which are identified with the idea of exploration. The first of these is the teacher's formal and informal study of the reactions of his pupil in trying out situations. This consists of observation, testing and professional diagnosis on the part of the teacher in the Industrial Arts setting. Teachers study their pupils in order to help them. Out of this significant phase in the process of exploration should come 'findings' and they should be understood and used.

A fifth concept in connection with exploration concerns the personal-social problem side. This has important applications to adolescent groups. The socialized nature of the Industrial Arts setting make it a most fitting place for the discovery and development of desirable adolescent traits.⁴⁰

He also held the opinion that the development of consumer knowledge and appreciation, aesthetic appreciation and personal-social traits were legitimate fields of study for industrial arts. Along with these, he maintained that:

The complexity of the industrial age in which we live demands that if the individual is to cope intelligently with the environment in which he lives, the school should provide a rich enough range of experiences to give at least a reasonable spread of technical knowledges. Herein lies a fertile field for the Industrial Arts. We have been so concerned with the production of 'things' or projects, that many of our Industrial Arts units have lacked richness. As education comes to concern itself more and more with real situations, this much-needed objective will be achieved in greater measure.⁴¹

In forecasting the future of industrial arts, Tingley said:

Let us hope that the future will see many changes for the better in our Industrial Arts setup. We trust that the time may soon come when the practice of relegating 'shops' to the basement or to some makeshift area, poorly lighted and ventilated, will be a thing of the past. The shop should be one of the most attractive spots in the school. The future can hold startling and worthwhile developments if we as teachers give progressive leadership. We need in the future less artificial devices to force learning and more activity which appeals to the social impulses. A greater emphasis will, no

⁴⁰Ibid., p. 31.

⁴¹Ibid., p. 34.

doubt, be placed on consumers' education and on an intelligent appreciation of the world in which we live. There should be less emphasis on what the boy should know and more on what he should be, and how he should feel toward the rest of society. We should look forward to less blind following of tradition and a greater willingness to experiment intelligently. It is to be hoped that visual education, the conference method, the group project method and industrial observation trips will come into greater use. We need less trade centered education and more child and society centered education.⁴²

By 1940, the program for junior high general shops was outlined as follows:

Phases of Work for Each Grade

GRADE VII		GRADE VIII		GRADE IX	
Drafting	Compulsory	Drafting	Compulsory	Drafting	Compulsory
Woodwork	Compulsory	Woodwork	Optional	Woodwork	Optional
Metal	Optional	Metal		Metal	Optional
Electricity	Optional	Electricity	One	Art Metal	Optional
Wire	Optional	Plastic	Compulsory	Electricity	Optional
Plastic		Materials		Automotives	Optional
Materials	Optional	Paper	Optional	Farm	
Paper	Optional	Leather	Optional	Mechanics	Optional
Leather	Optional	Bent or Vene-		Leather	
Printing	Optional	tian Iron	Optional	Craft	Optional
		Printing	Optional	Concrete	Optional
				Printing	Optional ⁴³

For Farm Mechanics, the following applied:

In all the grades, Drafting is compulsory for all students. In Grade VII, students must take Wood, and one additional phase as set out above. In Grade VIII, a choice may be made between Metal, Electricity and Plastic Materials, and one additional phase must be taken. In Grade IX, a wider choice is permissible. At least two phases must be chosen in addition to Drafting, and not more than three.⁴⁴

⁴²Ibid., p. 40.

⁴³Department of Education, Programme of Studies for the Intermediate School and Departmental Regulations Relating to the Grade IX Examination (Edmonton: 1940), p. 200.

⁴⁴Ibid.

The range of work was to be as varied as possible " . . . the limitation being the degree of versatility on the part of the teacher and the range of available equipment and material."⁴⁵ The objectives as stated were as follows:

An important objective to be kept in mind at all times is the training of the individual student in the fundamentals of the subject, allowing at the same time full sway for the expression of his individuality.

More specifically, the instructor should keep before him constantly the following educational objectives:

1. To provide an opportunity for creative expression and problem-solving through the medium of tools and materials.
2. To satisfy the desire which boys have to express themselves through the medium of tools and materials.
3. To develop habits of neatness, orderliness and accuracy.
4. To inculcate respect for honest labor and an understanding of its social significance.
5. To assist the student in the better choice and use of industrial products and services.
6. To develop normal ability in the use of common tools that may be of direct use in earning a living or in pleasantly using leisure time.

Correlation with English, Social Studies, Science, Mathematics, Geography, History and Art should be made whenever and wherever possible.⁴⁶

Each student was to spend one half day per week in the shop.

The high school program underwent a major modification in 1940 with the adoption of a program which consisted of a few compulsory

⁴⁵Ibid.

⁴⁶Ibid., pp. 200-201.

subjects and a number of electives.⁴⁷ The common compulsory subjects were English and Social Studies which were to be taken for three years. In addition " . . . a common high school diploma replaced the different ones formerly issued by the Department of Education for the various patterns or courses."⁴⁸ A distinctive feature of the new high school organization was the introduction of the credit system. A credit represented thirty-five minutes of instruction or class time per week. One hundred credits were necessary for graduation with a high school diploma and thirty-three of them were required in the compulsory subjects. In addition to English and Social Studies, all grade X students were required to take Health and Physical Education I, Mathematics I and Science I.

The technical electives (or Group C options) that were available in grades X, XI and XII were Woodwork, Metalwork, Electricity, Automotives, and Arts and Crafts. For the girls, Homemaking was available in addition to Fabrics and Dress.⁴⁹

Technical courses under General Electives were Mechanical Drawing and General Shop.

In the Annual Report of 1945, Tingley was able to report that:

As of December 31, 1945, 162 shops were in operation at 97 centres. Fifty-eight of these shops were on circuits served by travelling instructors.

⁴⁷ Department of Education, Programme of Studies for the High School, Bulletin I (Edmonton: 1940), p. 1.

⁴⁸ Grywalski, op. cit., p. 45.

⁴⁹ Department of Education, Programme of Studies for the High School for the year ending July 31, 1944 (Edmonton: 1944), pp. 10-12.

Ninety-four instructors were employed, 55 of them providing full time instruction and 39 part time.

Fifteen new centres were opened during the year and 6 centres reopened that had not been in operation the previous year. The unit registration in General Shop and shop subjects (including Group 'C' options) was approximately 8,000.⁵⁰

He also noted that since the war was over, a steady expansion could take place since many Boards were " . . . only awaiting the release of building supplies and equipment necessary to implement their plans."⁵¹

In the Annual Report of 1950, Robert Byron, who replaced Tingley as Supervisor of Industrial Arts upon the latter's retirement in March, 1950, reported that 128 teachers were employed teaching shop in 116 centres and that they had an enrollment of 11,181 students.

Byron was aware of a change of philosophy taking place when he noted:

In spite of some opposition to the philosophy of the broadened curriculum, there is an increasing realization of the role of industrial subjects in general education . . .

There is an increasing realization of the exploratory value of Industrial Arts courses and of the need for experiences in phases other than Woodwork, which has been the traditional and popular medium. Electricity, Metalwork, Concrete work, and crafts including Leatherwork, Plastics and Bookbinding are being treated with increasing success. A major purpose of such courses is to familiarize pupils with the raw materials, products and processes of industry, and it would be unfortunate to limit such experiences to Woodwork.

Although industrialization is 'in the air' in Alberta, and extension of industrial courses is desirable, there is a questionable trend in some smaller centres towards highly specialized technical programs. The shop subjects in schools located in the smaller towns should probably be related to the agricultural industry. Such

⁵⁰ Department of Education, Annual Report, 1945 (Edmonton: 1946), p. 55.

⁵¹ Ibid.

courses as Farm and Home Mechanics will meet the needs of a larger number of students than will the eight-credit technical electives, which are frankly trade preparatory. Pupils desiring trades training are not seriously handicapped where technical electives are not offered, since training is available to them through the apprentice training program.⁵²

On January 1, 1952, J. P. Mitchell, who was an industrial arts instructor in the University School,⁵³ took over the position of Supervisor of Industrial Arts for the province, as Byron left on a leave of absence to serve in an advisory capacity to the International Labour Office in Geneva. During 1952, considerable effort was expended to revise the high school program, so that the " . . . grade X level be revised to conform with the philosophy of general education in this grade."⁵⁴ The following courses were rewritten on a unit basis and credit values changed as indicated.⁵⁵

Woodwork 1 (8 credits) and Woodwork 1a (4 or 5 credits)
to Woodwork 10 (4 or 5 credits);
Metalwork 1 (8 credits) and Metalwork 1a (4 or 5 credits)
to Metalwork 10 (4 or 5 credits);
Electricity 1 (8 credits) and Electricity 1a (4 or 5 credits)
to Electricity 10 (4 or 5 credits);
Automotives 1 (8 credits) and Automotives 1a (4 or 5 credits)
to Automotives 10 (4 or 5 credits).

Similarly, the course series formerly known as Farm and Home Mechanics was rewritten and changed in title as follows:

⁵²Department of Education, Annual Report, 1950 (Edmonton: 1951), p. 66.

⁵³Department of Education, Annual Report, 1952 (Edmonton: 1953), p. 10.

⁵⁴Ibid., p. 54.

⁵⁵In city high school unit shops, these 10-level courses could be offered for 4, 5 or 8 credits.

Farm and Home Mechanics 1 to General Mechanics 15;
 Farm and Home Mechanics 2 to General Mechanics 16;
 Farm and Home Mechanics 3 to General Mechanics 17.

The changes made in these courses are of a nature to facilitate the achieving of objectives and to facilitate programming.⁵⁶

In 1953, Mitchell commented on course objectives and indicated that some difficulty was experienced in diversifying instruction.

Continuous effort is being made to encourage centres to offer a diversity of program in keeping with the vocational exploration and consumer education objectives of these courses. There is continuous indication of a movement in the direction of increased breadth of media used in many shops. In some centres this is reflected in the improved accommodation provided for the school shop but much still remains to be done in this matter. The Supervisor is continually endeavoring to improve accommodation through conferences with architects, divisional superintendents and instructors.⁵⁷

In the Annual Report of 1954, Mitchell recorded that:

A major objective has been realized this year in that new interim course outlines have been prepared for all courses excepting the General Mechanics series. This curriculum revision was done by selected groups of specialist instructors who have given many hours of their time for this work. These new courses are available in the following curriculum bulletins:

Industrial Arts Grades VII, VIII and IX
 Woodwork 10, 21, 20, 30
 Electricity 10, 21, 20, 30
 Metalwork 10, 21, 20, 30
 Automotives 10, 21, 20, 30
 Arts and Crafts 10, 20, 30
 Printing 10, 20
 Drafting 10, 20⁵⁸

⁵⁶ Annual Report, 1952, op. cit., p. 54.

⁵⁷ Ibid.

⁵⁸ Department of Education, Annual Report, 1954 (Edmonton: 1955), p. 46.

In 1956, Mitchell indicated that there was an increased appreciation of the value of industrial arts courses. His reason for coming to this conclusion was that there was an " . . . increased concern on the part of school authorities to provide adequate accommodation and equipment."⁵⁹

He also noted that:

The shop curriculum is meeting with general approval and appears to have inherent the qualities of breadth of experience and flexibility of course structure so essential for a successful industrial arts program.⁶⁰

In the next annual report, Mitchell noted the significance of studying industrial arts in an industrially developing community and the contribution of industrial arts to general education.

The desirability of providing shop-type experiences in the school becomes increasingly apparent as industrialization rapidly develops in the province and industry becomes a more significant element of our culture. It is apparent throughout the province that the courses in industrial education are becoming quite generally accepted as an integral part of general education. Efforts are continuously being made to keep the course offerings meaningful and industrially realistic.⁶¹

In the 1950's, technical electives at the high school level, although being thought of as part of general education, were nevertheless very vocationally slanted. One indication of this was that in 1950 the

⁵⁹ Department of Education, Annual Report, 1956 (Edmonton: 1957), p. 43.

⁶⁰ Ibid.

⁶¹ Department of Education, Annual Report, 1957 (Edmonton: 1958), p. 46.

Provincial Apprenticeship Board gave recognition for high school unit shop courses on the following basis:

- a) A student who had successfully completed an approved Unit Shop (Woodwork 1, 2 and 3; Electricity 1, 2 and 3; or Automotives 1, 2 and 3) under a teacher holding journeyman's qualifications, could sit for an examination in any of these subjects. If successful the student could be granted one year of credit towards his apprenticeship, thus allowing him to enter into the second year.
- b) If he received his high school training under a competent teacher not holding journeyman's papers, he would be allowed to sit for a similar examination at the end of three months of on-the-job training, providing his work had reached a satisfactory standard.⁶²

At the same time articulation arrangements were made with the Institute of Technology and Art, enabling students who obtained H or A standing in Woodwork 3, Metalwork 3, Electricity 3, Automotives 1, 2 and 3 or Fabric and Dress 3 to proceed into the second year in the corresponding courses at the Institute.⁶³

The latter agreement, according to Grywalski, failed as there was " . . . little student interest in technical institute training and inadequate preparation of high school students in the technical and

⁶²Department of Education, Annual Report, 1950 (Edmonton: 1951), p. 46.

⁶³Ibid.

academic electives.⁶⁴ The program of articulation originally to be on trial for two years was to be closed in 1951.

However, Mitchell, in 1958 reported:

A function of the senior high school course is to contribute toward the achievement of the occupational preparation objective of the secondary school. In particular, the Grade XI and XII shop courses offered in the unit shops are intended, in part, to serve this function. During the year, a research project designed to evaluate the vocational effectiveness of these courses was undertaken under the aegis of the Conference of the Composite High School Principals. The results of the study indicated that about one-half of the senior shop students may be taking courses for vocational purposes and of these about one-half likely find vocational value in them. Since these courses also contribute to the general education program of high school students, this survey is an encouraging indication of the effectiveness of the senior high school technical electives.⁶⁵

From this statement, it appears that about 25% of the students enrolled in the senior courses found vocational value in them. The remaining 75%, it is concluded, found general education value in them.

Mitchell presented his last report for the 1960 year, as he was appointed principal of the prospective vocational and technical school in Edmonton. In this report, he described the junior and senior high school industrial arts programs as follows:

The industrial arts courses are elective courses offered at both the Junior and Senior High School levels. In the Junior High School, a major function of the courses is exploratory so that while the student is familiarizing himself with some of the tools, materials, and processes of industry he is being provided with an opportunity to determine and develop his manipulative and creative interests, aptitudes, and abilities. These courses are offered in multi-purpose general shops where a variety of experiences in a number of industrial areas can be provided. In the Senior High School, there is increased

⁶⁴Grywalski, op. cit., p. 71.

⁶⁵Department of Education, Annual Report, 1958 (Edmonton: 1959), p. 47.

concern for the realization of the pre-vocational and occupational preparation objectives. Most of the High School Courses are offered in composite schools where unit type shops facilitate a concentration of study and activity in broad industrial areas; general woodwork, general metalwork, electricity, automobiles and less frequently, drafting, craftwork, and printing.⁶⁶

It is noted from the preceding statement that the junior high program was largely exploratory in nature, being offered in multi-purpose general shops. In the high school program, there was an ever-increasing emphasis on the vocational aspect of the training which was mostly undertaken in unit shops.

One recurring problem reported by Mitchell throughout his period as Supervisor of Industrial Arts was the shortage of qualified instructors. In the 1960 report, he stated: "The major area of concern remains the inadequate supply of suitably qualified teachers."⁶⁷

By 1961, the winds of change were once again blowing strongly in industrial education in Alberta. Early that year, the Technical and Vocational Training Agreement between the province and the Government of Canada was signed, which had a tremendous impact on industrial education in the province. The University of Alberta in Calgary moved to its new campus in northwest Calgary. The Industrial Arts Specialist Council of The Alberta Teachers' Association was formed and R. H. Cunningham became Supervisor of Industrial Arts.

Actually, the necessity of change in the province's high school industrial arts program was apparent to some educators prior to this time.

⁶⁶Department of Education, Annual Report, 1960 (Edmonton: 1961), p. 68.

⁶⁷Ibid., p. 69.

As far back as 1958, a report was made on the vocational effectiveness of Automotives 20, Automotives 30, Metal 20 and Metal 30, which were offered in seven composite high schools during the 1954-55 and 1955-56 school terms.

The results of the study indicated that 43% of the students " . . . could have been taking the courses for the purpose of vocational preparation."⁶⁸ It was assumed that for the remaining 57% " . . . the intent was industrial arts . . . "⁶⁹

The purpose for undertaking the study is quoted below:

The Conference of Alberta Composite High School Principals was formed in March, 1956. At the October, 1956 meeting the role of the technical elective courses in the Composite High School was discussed. It was accepted that these courses are presently organized to serve a dual function: The general educative needs of students whose vocational destiny may be other than in the industrial world; and the vocational educative needs of students who will use the skills and knowledge involved for vocational purposes.

With respect to the latter function it was recommended that a survey be made to evaluate the extent to which these courses are being used vocationally. As a secondary purpose such a project would evaluate the research resources presently available within the various schools.⁷⁰

It is interesting to note the vocational emphasis given to the courses. The study was not undertaken to determine the extent that the courses met industrial arts objectives, but only the vocational values, indicating that some confusion existed in the definition of objectives.

⁶⁸ Final report for the study concerning the vocational effectiveness of the Auto 20, Auto 30, Metal 20 and Metal 30 courses offered in 1954-55 and 1955-56 in seven Alberta composite high schools prepared by the Conference of Alberta Composite High School Principals (Department of Education Archives, Edmonton, 1958).

⁶⁹ Ibid.

⁷⁰ Ibid.

At the meeting of the Industrial Education Curriculum Sub-Committee held on April 14 and 15, 1959, the question was: "Is the purpose of the grade 11 and 12 shop courses primarily vocational, technical, or part of general education?"⁷¹ The question was not resolved.

Robert Warren, former Superintendent of the Calgary Public School Board, was reported by the Albertan as saying:

Taking into account the fact that only about 10 to 15 per cent of students will attend university, and that 85 per cent will not, better courses should be devised so the majority can take vocational training.⁷²

Harvey Bliss, (former chairman of the Calgary Public School Board), was especially critical of the high school shop program, and felt that the program should be revised considerably or dropped by the Department of Education. He is quoted in the Herald as saying:

As the curriculum is laid out now, the course is not being used for the purpose for which it was intended and it does not seem to lead anywhere.

The students don't get any credit on the high school shop courses when they enter the Southern Alberta Institute of Technology and I don't think industry gives much recognition to them.⁷³

He also noted that " . . . many of the students taking the courses were matriculation pupils."⁷⁴

In the following editorial appearing in the Albertan, some agreement with Bliss' recommendation is indicated:

⁷¹Minutes of the Industrial Education Curriculum Sub-Committee meeting held at the Southern Alberta Institute of Technology and Art, Calgary, April 14 and 15, 1959 (Department of Education Archives, Edmonton).

⁷²The Calgary Albertan, December 31, 1960. (See appendix p. 179.)

⁷³The Calgary Herald, April 8, 1961. (See appendix p. 180.)

⁷⁴Ibid.

As Mr. Bliss says, the shop courses are not fitting students for employment in trades, although this, presumably, was one of their objectives. In addition, they are costly to provide, since it takes more money to build and equip an 'industrial arts' room than it does to build and equip an ordinary classroom. Finally, the shop courses help to lower educational standards by constituting a temptation to students who should be studying mathematics or literature instead of learning how to make ash trays.

This latter difficulty might be readily overcome by prohibiting students following the matriculation program in the high schools from taking shop courses as 'electives,' at the same time raising the standards of achievement required of matriculants. This is a good answer as far as it goes, but it obviously doesn't go far enough. Mr. Bliss points out that the problem of what to do with the students who couldn't meet matriculation - course requirements would remain; and the schools would still be spending precious funds on shop courses of little value.

The logical answer is to revise these courses so that they are valuable -- so that they lead either directly into employment upon graduation from high school or fit those who have taken them for post-high school vocational or technical training. Indeed, this is not only a logical answer but a just one, for youngsters who lack the qualifications for matriculation courses leading to university are nevertheless entitled to the opportunity to develop their abilities in other fields.⁷⁵

By October of the same year, the Herald reported that:

Preliminary plans for two new high schools, which will save taxpayers at least \$1,000,000 if they are built before March 31, 1963, were approved by the Calgary Public School Board Thursday.

The schools will include vocational training wings which qualify for 90 per cent federal government grants if completed before March, 1963.

'The stakes in this are very high,' said Robert Warren, superintendent of schools. 'This is Calgary's first opportunity to get sizable assistance from the federal government. We've got to get this to the School Buildings Assistance Board as soon as we can.'⁷⁶

⁷⁵ The Calgary Albertan, April 15, 1961. (See appendix p. 181.)

⁷⁶ The Calgary Herald, October 13, 1961. (See appendix p. 182.)

By November 17, 1961, according to the Herald, nine school districts had " . . . submitted plans to the provincial government for some \$17,300,000 worth of vocational school construction."⁷⁷ The Herald article reported Dr. Chalmers, who was director of school administration for the Department of Education, as saying that the figures were for buildings only. They did not include an estimated \$2,500,000 equipment cost.⁷⁸

The sudden switch from the threatened shop closure in April to the whole-hearted embracing of vocational education in the fall of 1961 was due to the availability of money provided by the Technical and Vocational Training Assistance Act passed in 1960. Under the Act, the federal government agreed to finance 75% of the cost of providing technical and vocational education facilities if the province paid the remaining 25%. Originally, the federal government reimbursed the province for 75% of the money paid by the province. Alberta intended to pay 90% of the cost, leaving 10% for the local district to finance. This meant that the federal government would pay 75% of the 90% which equalled 67.5% of the total bill. This was later modified so that the province paid 100% of the cost and the federal government reimbursed 75% of this to the province. Hence, the Government of Alberta paid 25% and the Government of Canada paid 75%.

⁷⁷The Calgary Herald, November 17, 1961. (See appendix p. 183.)

⁷⁸In addition to the projects being planned by the nine school districts, an additional \$3,500,000 was earmarked for the provincial technical institute in Edmonton. The total building cost was therefore \$20,800,000 plus \$2,500,000 for equipment making a total outlay of \$23,300,000.

The terms of the agreement provided funds for nine major programs, being: (1) Vocational High School Training Program, (2) Technician Training Program, (3) Trade and Other Occupational Training, (4) Training Program in Cooperation with Industry, (5) Program for the Training of Unemployed, (6) Program for the Training of the Disabled, (7) Program for the Training of Technical and Vocational Teachers, (8) Training Program for Federal Departments and Agencies and (9) Student Aid.

The two programs of interest to this study are programs one and seven. The Vocational High School Training Program covered " . . . those courses, given as an integral part of high school education, in which at least one-half of the school time is devoted to technical, commercial and other vocational subjects or courses designed to prepare students for entry into employment by developing occupational qualifications. It may also include courses which provide students with an essential basis for further training after leaving regular high schools."⁷⁹

Program seven provided assistance for the establishment of the Department of Industrial and Vocational Education at the University of Alberta, under which high school vocational teachers received their training.

Although this was the most extensive and comprehensive federal grant for technical education, it was by no means the first. In 1913, the federal Agricultural Assistance Act provided ten million dollars over a ten-year period to encourage agricultural development. The

⁷⁹ Department of Education, Annual Report, 1962 (Edmonton: 1963), p. 92.

Technical Education Act of 1919 provided another ten million dollars over ten years which was to be used for technical education. In Alberta, Chalmers reports that " . . . the bulk of the grants claimed were used by the Calgary Institute of Technology and Art."⁸⁰ The Agricultural and Unemployed Relief Act passed in 1937 provided one million dollars per year to be used for training in agriculture, dressmaking, forestry, mining, practical nursing, home service, blacksmithing, woodworking, welding, machine operating, electricity, sheet metal and motor mechanics.

World War II brought about the Vocational Training Coordination Act in 1942, which was amended in 1948. The Technical and Vocational Training Assistance Act of 1960 replaced it.

As can be imagined, these huge grants provided by the 1960 Act were to have a tremendous impact on education in the province. Shops had to be planned, equipment selected and ordered, programs established, curriculum guides written and teachers trained. In addition to this, an examination of the whole field of industrial education would have to be undertaken. The first phase of this examination was centred on the high school program.

On February 1, 1961, a committee made up of the following men met to prepare " . . . a statement for presentation to the meeting of city board members and their officials on February 10."⁸¹

⁸⁰Chalmers, op. cit., p. 209.

⁸¹See appendix pp. 184-185.

Dr. W. H. Swift - Deputy Minister of Education
 Dr. T. C. Byrne - Chief Superintendent of Schools
 M. L. Watts - Director of Curriculum
 A. B. Evanson - Associate Director of Curriculum
 R. E. Byron - Director, Division of Vocational Education
 J. P. Mitchell - Supervisor of Industrial Arts
 Dr. H. T. Coutts - Dean, Faculty of Education, University of
 Alberta
 E. W. Wood - Principal, Provincial Institute of Technology
 and Art
 Dr. R. E. Rees - Assistant Chief Superintendent
 Dr. H. S. Baker - Assistant Dean of Education, University of
 Alberta, Calgary

Tentative conclusions reached by this committee were:

1. There was a need for pre-employment training for the trades as the technical institute moved away from this field.
2. High school vocational courses would have to be very specific and not exploratory. As a consequence, students would spend a greater part of their time in the shops, teachers would need at least journeyman's qualifications, close liaison with industry would be necessary and the students' other courses in the school should be related to trade training.
3. Articulation with the Institute of Technology should be provided.⁸²

The Department was aware that other committees should be struck.

In a letter to Dr. Swift dated August 17, 1961, Byrne wrote:

The need for the establishment of a Technical-Vocational Committee of the Senior High School has been discussed and placed before the minister. My understanding is that tentative approval has been given to the establishment of this committee.⁸³

The proposed major function of the committee approved by the Minister was to " . . . coordinate the planning and organization of technical-vocational education in the provincial high schools."⁸⁴

⁸²Ibid.

⁸³See appendix p. 186.

⁸⁴See appendix p. 186.

The tentative committee was to be made up of the following:

Mr. R. H. Cunningham (Chairman)
 Mr. R. E. Byron
 Mr. J. P. White (or some other representative from the Apprenticeship Board)
 Mr. E. W. Wood (Southern Alberta Institute of Technology)
 Mr. J. P. Mitchell (Northern Alberta Institute of Technology)
 Mr. O. Massing
 Mr. A. B. Evenson (representing the City of Edmonton)
 Mr. W. E. Robinson (Supervisor of Industrial Arts, Edmonton system)
 Mr. T. M. Parry (Supervisor of Vocational Education, Calgary)
 Mr. R. Warren (or his representative)(representing city of Calgary)

The Chief Superintendent of Schools and the Director of Curriculum will be ex officio members of this committee.⁸⁵

Although most of the emphasis at this time was on vocational education, Gallagher noted that the establishment of vocational education facilities:

. . . provide an impetus for curriculum committees to examine the content of other subject areas in the secondary schools. There appeared to be a close relationship between some courses in industrial arts and certain areas of vocational education. A clearly-defined relationship, however, was considered to be lacking.⁸⁶

Gallagher referred to the report of the Alberta Royal Commission on Education who, upon examining high school electives, reported:

The Commission's impression is that some of the electives provided go beyond the requirements of general education and approach a degree of vocational training which is incomplete and ineffective. The difference between general mechanics and subjects such as woodwork, metalwork, and automotives illustrates a somewhat indistinct line between general education and vocational education. Since the Commission holds that vocational education must be thorough, practical and immediately useful, it suggests that the

⁸⁵ Ibid.

⁸⁶ James E. Gallagher, "A Descriptive Analysis of Industrial Arts in Alberta" (unpublished Master's thesis, University of Alberta, Edmonton, 1963), p. 5.

latter courses represent inadequate vocational training. Their inclusion among general electives can only perpetuate fragmentary vocational programs.⁸⁷

Despite the stress placed on the development of vocational education, Cunningham was able to report continuing growth in the industrial arts program in the province. During 1961, 289 industrial arts shops were in operation and 261 shop teachers were employed.⁸⁸

In March of 1962, R. Byron, who was director of Vocational Education for the province, resigned to join the Federal Department of Labour. He was succeeded by J. P. Mitchell, principal of the Northern Alberta Institute who, for eight years, had been the Supervisor of Industrial Arts for Alberta. He stated in the 1962 Annual Report that the major intention of the Technical and Vocational Training Agreement was:

. . . to encourage the development of effective technical and vocational training facilities, and thereby increase the supply of skilled manpower in Canada.⁸⁹

He also noted that it " . . . led to a 'crash type' planning of physical facilities with the intention of completing the construction and equipping of projects by March 31, 1963."⁹⁰

The high school vocational education program was launched with projects being approved for the Calgary Public and Separate system,

⁸⁷ Report of the Royal Commission on Education in Alberta, 1959. A report submitted by Hon. D. C. Cameron, Chairman (Edmonton: The Queen's Printer, 1959), p. 136.

⁸⁸ Department of Education, Annual Report, 1961 (Edmonton: 1962), p. 52.

⁸⁹ Annual Report, 1962, op. cit., p. 93.

⁹⁰ Ibid.

Drumheller, Edmonton Public and Separate system, Grande Prairie, Grouard, Lethbridge, Medicine Hat, Red Deer, Stettler, West Jasper Place and Camrose. Many others were added later.

In addition to supplying facilities, vocational courses had to be developed and vocational teachers trained. Course development in the province was under the direction of the Division of Instruction and the responsibility for preparing the required new courses became that of the Supervisor of Industrial Arts, R. H. Cunningham.

In the 1962 Annual Report, he related that:

The Department undertook responsibility for the preparation of three year vocational-diploma programs in the following areas: automotives, electricity, electronics, food preparation, carpentry, machine shop, sheet metal, commercial art, and graphic arts. These courses are to have credit values of 5, 15, and 20 in Grades X, XI, and XII respectively. Where possible, these will cover the same content as the first year of the corresponding course at the Institutes of Technology.⁹¹

Cunningham, who had been an instructor at the Institute of Technology and Art, strongly supported the idea that the high school courses should receive recognition from this institute, which had become the Southern Alberta Institute of Technology and Art. Articulation arrangements were also to apply to courses taken at the Northern Alberta Institute of Technology which was designed during the summer and fall of 1961. The completion of the first two buildings was scheduled for September, 1962. As a consequence, courses were written to provide the same content offered in the first year of the Institute

⁹¹Ibid., p. 43.

courses. The original articulation arrangements never achieved the measure of success hoped for and were later altered.⁹²

Industrial Arts enrollments continued to grow and Cunningham reported that in 1962, 30,488 students were taking Industrial Arts from 287 teachers in 311 operating shops.⁹³

While he was directing the development of vocational education in Alberta high schools, Cunningham also retained the industrial arts responsibility. Vocational education by its very nature requires in-depth study, while industrial arts leans towards breadth. It seems that Cunningham attempted to support the differing aims of each when he stated the following in the 1962 Annual Report:

During the past year, increased effort has been made to encourage industrial arts teachers and school boards to offer a more diversified program in keeping with the general education and exploratory objectives of the Alberta program. Much has been accomplished toward this end through meetings with school boards, architects, superintendents, and instructors. There are signs of increased interest in the pre-vocational objectives of industrial arts in that several schools are planning the construction of second shops which will not only broaden the program but permit some depth of instruction in a few areas.⁹⁴

⁹²The lack of successful articulation was due to a number of factors, among which was the difficulty articulating students had in meeting academic standards of the Institutes both for admission to programs and maintaining passing grades once enrolled. Some vocational teachers resented the restrictions placed upon them by articulation arrangements. These factors were partially responsible for the decision to adopt some locally developed courses which were numbered 15, 25 and 35.

⁹³Annual Report, 1962, op. cit., p. 44.

⁹⁴Ibid., p. 43.

By October, 1962, Cunningham was " . . . granted leave of absence from his supervisory position to devote full time to the preparation of the Department's vocational-diploma programs . . . " ⁹⁵

The Supervisor of Industrial Arts position was temporarily occupied by M. R. McDougall. McDougall, like Cunningham, had been an instructor at the Provincial Institute of Technology and Art in Calgary. He was trained as an industrial arts teacher in Calgary and had previously taught industrial arts for the Calgary Public School Board. It is interesting that, like Mitchell and Cunningham, McDougall obtained his Master's degree from the University of Oregon.

Further significant developments in the industrial education scene took place in 1962. The two having the greatest impact were probably the establishment of the Division of Vocational Education at the University of Alberta in Edmonton and the appointment of Dr. Henry Ziel to chair the Department in July of 1962. The division was primarily established to provide a program of training for tradesmen leaving industry and attempting to qualify as vocational education teachers. This, however, soon was expanded to include training for industrial arts teachers.

By September of 1962, Ziel had begun to express his ideas of what should be expected of vocational and industrial arts education. In an article published in The A.T.A. Magazine, he said that vocational and industrial arts education " . . . provide an environment wherein students can through actual practice bring together the various truths that have

⁹⁵ Department of Education, Annual Report, 1963 (Edmonton: 1964), p. 38.

been transmitted in the other academic disciplines."⁹⁶ He also noted that:

. . . vocational education seeks its skill content in the world of work, it becomes evident that the direction of educational offerings must be attuned to the type of thinking most prevalent in the industrial community it proposes to serve. Industrial arts, because it finds its base in prevalent technologies within the world of work, must be equally well attuned to the most predominant way of thinking . . . The opportunity for upward mobility within an enterprise is available, but the chief mobility factor is not the perfection of current skills, but rather the attainment of greater knowledge to render more intelligent decisions from the ever increasing font of available information.⁹⁷

In the November issue of the same magazine, Ziel expressed his ideas further. Among these, he advocated firstly the development of a philosophy of vocational education which:

. . . must be vital and express fundamental beliefs which students can accept because a consistency of value systems is evident in the community where they live as well as in the community where they will work.⁹⁸

Secondly, he felt that a vocational education program must have direction which is meaningful to students. His third contention was that obsolete skills have no place in the educational curriculum and that " . . . more emphasis should be placed on skills in a family of occupations to permit horizontal movement before or after entry into business or industry."⁹⁹

⁹⁶Henry R. Ziel, "Industrial Arts and Vocational Education in A Changing Society," The A.T.A. Magazine, Vol. 43, No. 1 (Edmonton: September, 1962), p. 16.

⁹⁷Ibid., p. 18.

⁹⁸Ibid., p. 14.

⁹⁹Ibid.

He also recommended high performance standards and frequent program review.

During a meeting held on November 14, 1962, Dr. H. T. Coutts, Dean of the Faculty of Education at the University of Alberta, explained the difference between vocational education and industrial arts. He held the opinion that industrial arts had never realized the goals set for it in Alberta, partly because of equipment limitations and restricted teacher experience. Coutts also expressed a desire to experiment with a broadly based industrial arts program on the Edmonton Campus.¹⁰⁰

On April 11, 1963, a meeting was called by the Faculty of Education Deans (Calgary and Edmonton) to discuss the problems related to industrial arts and vocational education programs. The following men were present:

Dr. T. C. Byrne	- Chief Superintendent of Schools
J. P. Mitchell	- Director of Vocational Education
M. L. Watts	- Director of Curriculum
R. H. Cunningham	- Supervisor of Industrial Arts
M. R. McDougall	- Acting Supervisor of Industrial Arts
Dr. S. C. T. Clarke	- Executive Secretary A.T.A.
G. Sutherland	- President, A.T.A. Specialist Council in Industrial Arts
A. A. Day	- Secretary, A.T.A. Specialist Council in Industrial Arts
F. E. Whittle	- Provincial Apprenticeship Board
W. A. B. Saunders	- Northern Alberta Institute of Technology
F. Jorgenson	- Southern Alberta Institute of Technology
Dr. H. S. Baker	- Dean, Faculty of Education, University of Alberta, Calgary
Dr. T. G. Finn	- Faculty of Education, University of Alberta, Calgary
Dr. S. A. Lindstedt	- Faculty of Education, University of Alberta, Calgary

¹⁰⁰ Minutes of the Board of Teacher Education and Certification held in the Department of Education Library, Administration Building, Edmonton on November 14, 1962, p. 3. (See appendix pp. 187-189.)

- Dr. H. R. Ziel - Chairman, Division of Vocational Education,
University of Alberta, Edmonton
- Dr. H. T. Coutts - Dean, Faculty of Education, University of
Alberta, Edmonton
- J. E. Gallagher - Faculty of Education, University of Alberta,
Edmonton

The meeting was chaired by Dr. Coutts.¹⁰¹

Dr. Coutts reported that in the newly established vocational teacher program, 84 candidates were registered, all having journeyman or equivalent status.¹⁰² In the industrial arts teacher program, enrollments were reported to be: First year - 27, Second year - 13, Third year - 13 and Fourth year - 4.

He noted that with the new emphasis on vocational education, an examination should be made of industrial arts courses being taught in the province.

At this meeting, a proposed alternative industrial arts teacher education program to be offered at the Edmonton Campus was presented. This became one of the initial steps resulting in the industrial arts teacher training program being transferred from Calgary to Edmonton.

¹⁰¹ Minutes of a Meeting to Discuss Industrial Arts Programs in the Faculty of Education, University of Alberta, Edmonton. The meeting was held in Room 108, Education Building, University of Alberta. (See appendix pp. 190-207.)

¹⁰² The preparation of vocational education teachers in Alberta was the most rigorous in Canada. In order to qualify for entrance to the program, a candidate had to (a) have clear matriculation standing (the same as all other students entering the Faculty of Education), (b) possess a valid journeyman's ticket (or equivalent) and (c) have worked an additional five years in the trade (making a total of nine years trade training or experience). Once admitted to the program, the candidate could be licensed to teach (with a conditional certificate) after successfully completing one year of teacher training. After teaching for two years, this license could be made permanent. A degree could be earned by completing two additional years at the University, making a total of three years of the four-year program. The first year was granted for trade and industrial experience.

In the minutes of this meeting, it is recorded that Dr. Coutts outlined a proposal " . . . which seemed to agree generally with the lines of discussion."¹⁰³

The proposal was based on the following assumptions:

1. That the general education-multiple technologies approach to industrial arts has considerable promise but especially at the junior high school level.
2. That the vocational education program being offered in vocational high schools of the province will tend, in those centres where it is offered, to replace the industrial arts program in Grades X, XI, and XII and especially the unit shop offerings in industrial arts.
3. That the unit shop program in industrial arts will tend to continue in smaller centres where there are no vocational schools and this program may serve both a general education and a quasi-vocational purpose.
4. That the industrial technologies approach to industrial arts may well become a future general education offering in Grades X, XI, and XII.¹⁰⁴

The proposal as outlined in the minutes appears below:

1. All of the needs of the schools in relation to industrial arts and vocational education may be served through slight modification and revision of present programs.
2. The teacher education programs for industrial arts and vocational education be brought together under one Department of Industrial and Vocational Education and that this Department and the programs it offers be centred in one place, probably Edmonton.
3. Industrial technologies laboratories at a cost of approximately \$60,000 for equipment be set up either in the new Education Building, Edmonton, or in the Northern Alberta Institute of Technology.
4. The route to be outlined by Dr. Ziel would meet adequately all of the needs which we foresee both present and future.¹⁰⁵

¹⁰³Minutes of a Meeting to Discuss Industrial Arts Programs in the Faculty of Education, op. cit.

¹⁰⁴Ibid., p. 11.

¹⁰⁵Ibid.

The proposal was discussed by various members of the committee and further explained by Dr. Ziel. As a result of this discussion, the minutes record Dr. Coutts had the opinion that it:

. . . indicated that the program outlined by Dr. Ziel would be acceptable to the groups represented. The program for preparing industrial arts teachers has been approved by the General Faculty Council of the University. The next concern is whether only one type of program should be offered or whether one should be given in Calgary as at present and another in Edmonton. It was felt that the programs proposed would eliminate the need for a quota system in the shops in the Institute of Technology. It was agreed that the present program should be continued to serve those already taking the present B.Ed. in Industrial Arts program.¹⁰⁶

When the problem of operating the program in two centres arose, Dr. Byrne felt that Alberta was not big enough to offer the program in two centres and, since vocational education and industrial arts were so closely related, one should not be offered without the other. The minutes report that: "He felt it was not necessary to operate in two separate places. He thought it should be concentrated in one spot. The vocational centre is now located here (Edmonton) and it seemed to him that the industrial arts centre should come along to it."¹⁰⁷

By the fall of 1964, no further first year registrations were accepted in Calgary and by 1967, the transition had been completed.

Ziel came to Alberta having an impressive background of industrial experience and professional training. His undergraduate and Master's degree were earned at Cornell University, New York and his Doctorate at Wayne State University in Michigan. Until his arrival, industrial arts was very strongly inclined toward skill development and

¹⁰⁶Ibid., p. 15.

¹⁰⁷Ibid., p. 16.

the shop program throughout the province emphasized skill in wood-working, drafting and metalwork.

Ziel proposed a fresh, new look at industrial arts in the province. In The A.T.A. Magazine published in February, 1963, he said:

Let us observe industrial arts always as a synthesizing educational process in a multiple activity environment. The argument for multiple activity is predicated upon the fact that no profession or occupational title operates in a vacuum. The interrelationships of functions, processes and technologies are very evident in society. As a synthesizing educational environment introduced at the seventh grade level it can help reinforce the purposes of academic disciplines. This same environment at this early age introduces youngsters, boys and girls, to a variety of experiences which will interpret the current world of work so that they can make a more intelligible choice for the future.¹⁰⁸

He envisaged a complete program to be pursued from grades VII through XII. This program was to be divided into four phases.

Phase I would be devoted to an introduction to, and an appreciation of tools, machines and materials. Phase II would encompass an elementary introduction to the various technologies prevalent in the world of work. Phase III would provide an educational experience that exposes youngsters to the many technological demands imposed upon organizations and their members as they function to fulfil the purpose of the organization. Phase IV would be devoted to a further appreciation of a cluster of technologies reflecting the student's preferences and abilities and emphasizing problem-solving through research and development type activities.¹⁰⁹

Phase I, carried out in a multiple-activity laboratory, would introduce grade VII boys and girls to machines and materials. Although projects would be used, they would be selected by the teacher " . . . to provide the most optimum learning experiences in terms of the objectives stated. This approach is evident in learning units presented in other

¹⁰⁸ Henry R. Ziel, "A New Concept of the Industrial Arts Program," The A.T.A. Magazine, Vol. 43, No. 6 (Edmonton: February, 1963), p. 18.

¹⁰⁹ Ibid.

academic disciplines."¹¹⁰ Projects at this level would be simple " . . . and their sole purpose is to introduce an appreciation of tools, machines, and materials and not an acquisition of skills."¹¹¹

In Phase II, students would be introduced to the various technologies such as electronics, computer, mechanical, power, power transmission, graphic communications and materials and processes. The phase would be recommended for grades VIII and IX. Ziel was convinced that as a student underwent experiences in the various technologies, he would acquire a profile of his abilities and interests which would assist him:

. . . to make a more intelligible selection for the future. In addition, these multiple experiences will reflect the significant role of the various academic disciplines as they function in a technological society. To say that youngsters cannot possibly comprehend these various principles is to deny the educational value of the many toys and kits available to the public. It must be understood that the complexity of principles introduced at this level are comparable to the complexity of the scientific principles introduced at the junior high school level and not those of a technician.¹¹²

Phase III, to be taken in grade X:

. . . provides an educational experience that exposes students to the many technological demands imposed upon organizations and their members as they function to fulfil the purpose of the organization at the Grade X level. Technological problems are easily reconciled. However, the greatest deterrent to the future success of any industrialized nation, in a democratic society, is the inability of its members to work productively. In this phase, several simulated situations would be employed.¹¹³

After having these experiences, he felt that the grade XI and XII students would have selected various paths or routes to finish their

¹¹⁰Ibid.

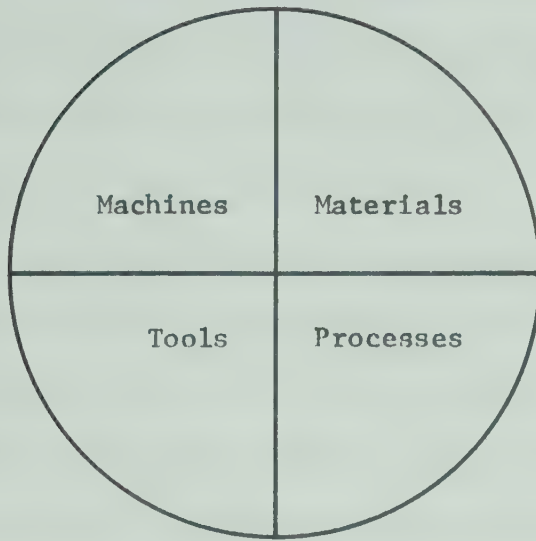
¹¹¹Ibid., p. 19.

¹¹²Ibid., p. 20.

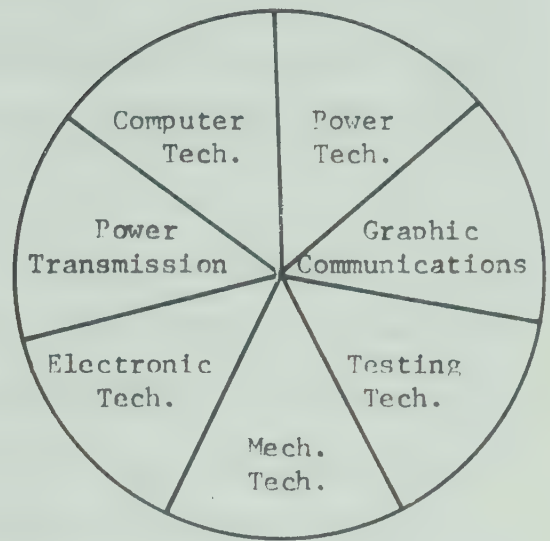
¹¹³Ibid.

high school programs. Those selecting university or vocational patterns would not enter into Phase IV. Students who did continue, however, having previously identified their fields of interest would concentrate on two or three technologies enabling study in-depth in these areas.

The basic concepts of the four phases are illustrated in the following diagrams:



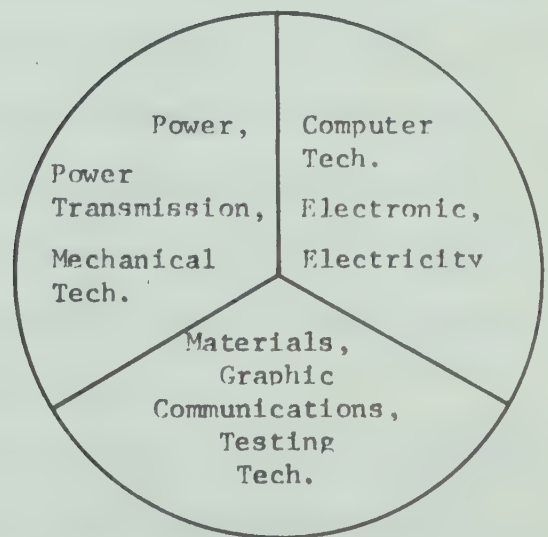
PHASE I



PHASE II



PHASE III



PHASE IV

114

This program conceived by Ziel was to be used at the University of Alberta as the basis for training industrial arts teachers. It also provided the foundation from which the provincial program for industrial arts was later developed.

In the Annual Report for 1963, McDougall, who was Acting Supervisor of Industrial Arts, was able to report 306 industrial arts shops open in the province and 288 teachers employed.¹¹⁵ In many of these shops, the emphasis was on skill development, particularly in drafting and woodwork. Although the shops in many cases were designed as general shops, students were organized on a lock-step basis. All students in a specific class took Woodwork at the same time. Electricity, Drafting and Metalwork were similarly scheduled. Some teachers in the province, however, had students working with different materials at the same time. One such teacher was J. D. Harder, who, on September 1, 1963, was to join the Department of Education as Supervisor of Industrial Arts.¹¹⁶ Cunningham had become High School Inspector, with special responsibilities for vocational education and McDougall had resigned to take up responsibilities with the Calgary Public School Board, for whom he later became Supervisor of Vocational Education.

Harder came to this position having taught industrial arts for many years in the County of Mountain View. He received his early industrial arts training in Alberta and had his Bachelor of Education

¹¹⁵ Annual Report, 1963, op. cit., p. 39.

¹¹⁶ Department of Education, Annual Report, 1964 (Edmonton: 1965), p. 12.

degree conferred upon him by the University of Alberta. Just prior to accepting the provincial position, Harder, like Mitchell, Cunningham and McDougall, had pursued graduate studies at Oregon State University. Under his leadership, the industrial program in Alberta was to undergo major modifications.

Upon being appointed to the position of Supervisor of Industrial Arts for Alberta, Harder undertook to examine the industrial arts program as it was presented in various centres in Alberta. This was done partly to determine if the charges made by Ziel that the Alberta program was myopic and failed to meet the needs of Alberta students. He travelled extensively throughout the province and found that in most industrial arts laboratories, the program consisted mostly of Woodwork, Drafting and Metalwork.

Harder was convinced that the multiple-activity approach of teaching industrial arts was the method that should be employed in Alberta. He came to this conclusion for many reasons. One of these was that he felt that this was the only kind of a program that would move industrial arts teachers away from the traditional program they had been offering in their laboratories for years.

A second reason, was the success of a pilot project developed by Ziel and his staff at the University which was carried out at Hillcrest Junior High School in Jasper Place, Edmonton. This project, originally entitled "The World of Work," was recommended for boys and girls and was conducted in a multiple-activity laboratory. Harder observed this program in operation and kept in close contact with the two teachers, Martin Shalka and Wes Rider, employed in the laboratory.

By Christmas of 1963, Harder had assessed the Alberta program, had observed the pilot project at Hillcrest and was prepared to recommend changes in the Alberta program. One of the first changes that he advocated was a revision of the Junior High School Industrial Arts Curriculum Guide.¹¹⁷ In order to accomplish this, a curriculum committee recommended by the Secondary School Curriculum Committee was approved by M. Watts, Director of Curriculum of the province. This committee was assigned the task of revising the Junior High Curriculum Guide so that a multiple-activity program could be developed in the province.

The multiple-activity approach to teaching industrial arts presented a radical departure from the program being taught in Alberta. Harder realized that effecting change in education is quite difficult. People in decision-making positions such as board members, principals and teachers would have to be given detailed information on the philosophy of the proposed program and how it could be implemented. As a consequence, he developed a slide presentation which showed the layout of multiple-activity laboratories, students working at various work stations in the laboratory, and an outline of the proposed multiple-activity program. He travelled throughout Alberta with this presentation and explained the proposed program to various boards, superintendents and administrators in the province. The effect was that the multiple-activity program caught the imagination of many administrators in Alberta. However, the program developed by Ziel at the University of Alberta lent intellectual status to the program being advocated by Harder. In addition, two

¹¹⁷ Minutes of the Junior High School Curriculum Committee meeting held on Friday, November 15, 1963.

of Alberta's foremost and respected educators, Byrne, from the Department of Education, and Coutts, from the University of Alberta, were in support of the multiple-activity approach to industrial arts which also tended to add stature to Harder's proposed program. In general, most of the superintendents and administrators supported this program despite some opposition from differing quarters such as the Calgary Public system. It should also be remembered that about this time, teachers taking industrial arts at the University of Alberta in Edmonton were being shown the advantages of multiple-activity instruction by Dr. Ziel and his staff. Throughout Alberta, a number of senior administrators and industrial arts teachers gave support to the new proposed program and slowly, multiple-activity instruction became a reality in the province.

The first school to build a new multiple-activity laboratory was in Taber. At Didsbury, a renovation program was undertaken to upgrade the existing industrial arts laboratory to a multiple-activity laboratory. Since that time, numerous new laboratories have been developed in the province and most of the older laboratories renovated to become multiple-activity laboratories.¹¹⁸

The Junior High School Industrial Arts Curriculum Sub-Committee met on December 5 and 6, 1963, with the following members being in attendance:

J. D. Harder	- Supervisor of Industrial Arts (Chairman)
L. A. Dublenko	- Calgary
J. Gallagher	- University of Alberta, Edmonton
M. McDougall	- Calgary Vocational
W. N. Pura	- Supervisor of Industrial Arts, Edmonton Separate School Board

¹¹⁸ This information was received during a personal interview with Dr. J. D. Harder, September 20, 1972.

B. V. Schrader - Edmonton Coordinator of Junior High School
Industrial Arts (Secretary)
M. Shalka - Hillcrest Junior High School, Jasper Place
R. Stonehocker - Lethbridge
A. Toronchuk - Mannville
Dr. H. Ziel - University of Alberta, Edmonton¹¹⁹

The committee visited classes operating at Hillcrest to help them understand the multiple-activity program. This also enabled them to identify some of the problems to be found in the type of organization and discuss possible solutions to them. Subsequent meetings were held on February 3, March 23 and April 17, 1964.

Objectives

The first problem to be resolved was the establishment or development of objectives. Four tentative general objectives were identified which are listed below:

1. Exploratory - for all youth.
2. Guidance - particularly timely in junior high school.
3. Reinforce and Synthesize Academic Disciplines.
4. Interpret Productive Society.¹²⁰

The new program was to be compatible with the functional objectives of secondary education in the province as published in the Curriculum Guide for Alberta Secondary Schools.¹²¹ These objectives

¹¹⁹ Minutes of the Junior High School Industrial Arts Curriculum Sub-Committee held in the Administration Building, Edmonton, September 5 and 6, 1963.

¹²⁰ Ibid., p. 2.

¹²¹ Department of Education, Curriculum Guide for Alberta Secondary Schools, 1950 (Edmonton: 1950).

considered by the committee and published in the 1964 curriculum are outlined as follows:¹²²

1. Personal Development

The prime aim of the school is to assist each student in his growth towards maximum self-realization. Students should be able to think rationally, have a broad understanding of the methods of science and the fundamentals of mathematics. Each student should also develop appreciation and understanding of the culture and social aspects of living.

2. Growth in Family Living

Youth should learn of the importance of the family unit and its place in society, particularly in its role in shaping values and morals in its members.

3. Growth Towards Competence in Citizenship

The function of this objective was to bring to the realization of each student his position and responsibilities in the school, community, province, nation and in the world.

4. Occupational Preparation

Students should learn the skills and attitudes that would make him a productive participant in economic life.

In addition to these objectives, the committee also examined the functions of the junior high school stated in the 1962 Junior High School Handbook.¹²³ Their reasons for doing so were that:

¹²²For the text of these objectives, see appendix pp. 208-209.

¹²³Department of Education, Junior High School Handbook, 1962-1963 (Edmonton: 1962).

The Department of Education in Alberta has stated specific functions for the junior high school which are in addition to the functional objectives of secondary education. It is important, therefore, that instructors of industrial arts interpret the junior high school industrial arts program not only in relation to the functional objectives of secondary education, but more particularly to the achievement of the functions of the junior high school.¹²⁴

These functions were:

1. To provide a setting in which the adolescent is understood and which makes possible a smooth transition from the elementary to the senior high school.
2. To continue the training of the elementary school in basic skills and knowledge and to broaden this training to include more opportunities for students to think critically and to draw generalizations.
3. To provide for the mental, physical and aesthetic needs of students and to develop talents in these areas.
4. To provide opportunities for the development of acceptable social, moral and spiritual values.
5. To help pupils discover special interests and abilities that will enable them to set realistic educational and vocational goals.¹²⁵

With consideration being given to the functional objectives and the specific objectives, the curriculum committee made the following statement and listed the specific objectives for junior high industrial arts:

Within the broad framework established by the functional objectives of secondary education and the more specific functions of the junior high school, the subject area of industrial arts has a most important role. The objectives and desired outcomes listed below for industrial arts establish the purpose of the industrial arts program, indicate the relationship of industrial arts to general education, and indicate the subject matter for industrial arts.

¹²⁴ Department of Education, Junior High School Curriculum Guide for Industrial Arts (Edmonton: September, 1964), pp. 3-4.

¹²⁵ Ibid., p. 5.

Specific Objectives

1. To develop an understanding of the productive aspects of society.
2. To provide exploratory experiences in the various technologies prevalent in the world of work.
3. To provide an opportunity for students to apply their skills in mathematics, science, and English to the solution of practical problems.
4. To provide an introduction to the multiplicity of occupational opportunities.
5. To develop an attitude of safety with a respect for safe working habits and practices in the use of tools, equipment, and materials.
6. To develop an attitude of personal and social responsibility.
7. To develop a degree of manual skill necessary to satisfactorily complete the requirements of each unit attempted.
8. To provide experiences which permit the growth and expression of individual creativeness.¹²⁶

Content

Another item considered by the committee was the selection of course content. The following areas of instruction were agreed upon:

1. Power Mechanics
 - a) Sources
 - b) Power Transmission
 - c) Mechanical Technology
2. Metals
 - a) Sheet and Bench Metal
 - b) Machine Shop

¹²⁶ Ibid.

3. Electricity - Grade VIII - basic electricity
Electronics - Grade IX - amplifiers, transmitters, power
supply
4. Wood - two units to be developed
5. Plastics
6. Graphic Arts
7. Graphic Communications - photography, blueprinting, blueprint
reading, drafting
8. Computer
9. Industrial Crafts
 - a) Ceramics
 - b) Art Metal
 - c) Leather
 - d) Lapidary

The guide was specifically organized and prepared for multiple-activity instruction. Since this method was new to Alberta, a fairly extensive description of the program was provided, some of which follows:

(a) The Multiple-Activity Program

The multiple-activity program is an organizational device by means of which a variety of exploratory experiences can be presented with a minimum of room and equipment. The shop is organized into nine different sections representing the course areas. Each section or bay is large enough to accommodate up to six students. These bays are as self-contained as possible with provisions made for the storage of tools and projects within them. The class is divided into three or more groups with each group working through the course unit in the bay assigned it. After the completion of the unit in from nine to twelve weeks the groups rotate each proceeding to another bay.

As the units consist of from nine to twelve weeks of work, each depending on the number of areas in operation, there will be several weeks unaccounted for. This time, two to four weeks should be used at the beginning of the year to organize the

activities of the groups, draw the first project for one area; teach the beginning lesson of each unit, give demonstrations and provide the information required to get each group started efficiently in their assigned areas.

Once group work begins, the instructor would move from one area to the next giving short lectures and demonstrations each period. The remaining time he would give individual help.

Another method would have the instructor present his lecture and demonstrations to the class as a whole. The lessons would rotate from group to group with material from their respective units. Information sheets would supplement the lesson for later review when the information becomes pertinent to the unit the student is in. The instructor would then review the theory with the individual groups.

Either method or a combination of both can be used. The grading of student achievement should be accomplished by the evaluation of work done on projects or experiments, by administering written tests with a minimum of one per unit and by evaluating the students' general progress in the formation of desirable attitudes such as responsibility and co-operation.

Poor management and lack of planning are bound to result in confusion. Therefore the instructor must have a well devised plan, firmly in mind, before attempting to operate a multiple-activity laboratory.

In the one or two shop organization this is the only way we can achieve the objectives we have set of providing broad exploratory experiences to all students. It is necessary that each instructor prepare himself to the best of his ability to meet those objectives.

(b) Course Areas

To provide a wide exploratory experience, nine basic areas are to be considered. The basic areas are subdivided into units. There are fifteen units, each from nine to twelve weeks in length. The minimum number of areas that should be covered in a three year junior high school program should be nine. Where equipment and instructors are available as many as thirteen can be taught. Where industrial arts is taught only two years in the junior high school, a minimum of six areas should be taught.

<u>Areas of Study</u>	<u>Units</u>
1. Power Mechanics	one
2. Metals	
- sheet and bench metal	one

- machine shop	one
3. Electricity-Electronics	
- electricity	one
- electronics	one
4. Computer	one
5. Wood - 1 and 2	two
6. Plastics	one
7. Graphic Arts (type setting, printing, silk screen, book binding)	one
8. Graphic Communications (photographs, drafting, blue print reading)	one
9. Industrial Crafts (only two units to be chosen)	
- ceramics	one
- art metal	one
- leather	one
- lapidary	one
9 areas	15 units

In addition to the nine units listed above, the junior high school industrial arts program includes a testing area and an instructional materials center. The testing area utilizes the materials and some of the projects made in the other areas. The instructional materials center is used as a students' resource room, conference room and research area.

(c) Length of the Program

The recommended minimum is four periods per week based on a forty week school year. The length of a shop period should be not less than a double period at one time.

There is a total of fifteen individual units excluding the testing section which is part of all of them. To benefit most from the program it should start in Grade VII and continue through Grade IX.

The minimum number of units to be taught each year is three with a maximum of five or as determined by the instructor and the time available. By the end of three years in junior high school a student should have covered from nine to thirteen units. If a three year program can not be instituted, the most representative units of productive industry should be chosen and taught in Grades VIII and IX.

(d) Organization and Design of Industrial Arts Areas

The industrial arts area is designed as a multiple-activity laboratory. It is desired that as many areas as possible be contained within one room and that each of the areas be self-contained with regard to tools, machines, and materials. An area which is planned to accommodate four to six students is recommended. These small groups would work in the different areas, e.g. four students would work in the sheet metal area, another four in woodwork and yet another four in electricity. Following the completion of required learning experiences in an area, the group proceeds to the next area. This system of rotation insures each student an introduction to all the components of the program.

A multiple-activity laboratory affords each student the opportunity to observe the interdependence of technologies and to visualize the basic tools, machines, and processes in each of the technologies. When more laboratories are available the number of units taught in each can be correspondingly reduced.

(e) Approach

The use of the project in industrial arts has merit. It is to be considered a vehicle for learning and nothing more. When the project becomes the focal point and ceases to be a media for this learning experience it should be discontinued. Carefully selected projects are recommended for some of the units included in this program. The woods, metal, plastics, and leather lend themselves well to the project method. The projects however should be predesigned and permit a measure of successful achievement for all levels of learning. Many of the units such as electricity, electronics, computer technology and power mechanics, lend themselves well to an experimental approach. Pre-designed and programmed laboratory exercises will assist in the degree of student understandings. The instructor should have available operation sheets, related information sheets, and job sheets. These would help him and his students organize their time efficiently.

Test-stand experiments will assist both in the understanding of these areas and in developing an appreciation for the scientific method.

(f) Suggested Organization of Teaching Units

<u>Grade VII</u>	<u>Grade VIII</u>	<u>Grade IX</u>
Graphic Arts	Wood	Electronics
Plastics	Electricity	Power
Leather	Graphic Communications	Mechanics
Ceramics	Sheet Metal and Bench	Computer
	Metal	Machine Shop

(g) Transition to the Revised Program

Starting from the units presently equipped for in 1964-65 and adding several units per year, the total program can be gradually built up.

<u>Have</u> <u>1964-65</u>	<u>Add in</u> <u>1965-66</u>	<u>Add in</u> <u>1966-67</u>	<u>1967-68</u>
Wood (1)	Electronics	Graphic Arts	Computer
Metal (bench & sheet)	Power Mechanics	Plastics	Industrial
Electricity			Crafts
Graphic Communications			
(Drafting & Blue Print reading)	Material testing equipment added continuously.		

In a single industrial arts laboratory it is recommended that the nine basic areas be set up. Some of the units can be carried on in the same area by a different class. For example the electricity and electronics would utilize the same area and some of the same equipment.

In a double laboratory set up, the two shops can divide the areas between them. E.g. one laboratory could be used for wood, electricity, electronics, industrial crafts and computer, while the other be set up for metal, power mechanics, plastics, graphic arts and graphic communications.

The planning of the areas or bays should be such that the benches are moveable. This provides for versatility because it makes rearrangement possible. The design of the benches will be such that areas can be made independent of each other.¹²⁷

Separate outlines for the nine units were provided. Each was arranged into two columns, one indicating what the students should do and the other describing what he should know.

When asked why the multiple-activity program was supported in Alberta, Harder replied that he thought that it was the only approach that would move teachers away from the program emphasizing skill development in few areas. Multiple-activity also provided the opportunity

¹²⁷Ibid., pp. 7-10.

to introduce the study of more industrial subjects into the industrial arts program.¹²⁸

In the spring of 1964 at the 26th annual convention of the American Industrial Arts Association, Gallagher, reporting on Ziel's program, stated:

Finally we come to the initial evaluation of the Ziel program. To say the philosophy of the program and the pilot projects have been accepted is an understatement. The junior high Industrial Arts curriculum in the Province of Alberta is being revised along the lines of the program. It is being introduced throughout the province on a transition basis beginning next September.

The senior high Industrial Arts curriculum is scheduled to be revised next year.

We realize that certain situational factors in the educational environment in Alberta made it possible for this program to be accepted more readily than might otherwise have been the case.

The Federal government made millions of dollars available to the province for the establishment of vocational education facilities. This demanded that a clear distinction be made between industrial arts and vocational education. At the same time, the subject area of industrial arts was being gradually eased out of the secondary education curriculum, partly because of pressure to add additional subjects to the curriculum. This was also because the conventional program of woods, metals, and drafting could not be justified as a general education subject for all youth.¹²⁹

High School Program

As indicated by Gallagher, the senior high school industrial arts program was also to undergo considerable modification. The first change occurred at the Senior High Curriculum Committee meeting held on April

¹²⁸ Personal interview with J. D. Harder, September 20, 1972.

¹²⁹ James E. Gallagher, "A New Concept of Interpreting Productive Society to Youth - A Description of the Ziel Program of Industrial Arts," New Directions for Industrial Arts, Addresses and Proceedings of the 26th Annual Convention of the American Industrial Arts Association (Washington: 1964), p. 72.

20 and 21, 1964, when O. Massing, who was the General Supervisor, High School Division for the Edmonton Public School Board, moved that " . . . all Industrial Arts courses be revised and limited to not more than five credits per course, to be introduced in September 1965."¹³⁰ This motion, seconded by J. D. Harder, was carried. Prior to the motion being presented, considerable concern had been expressed by some committee members regarding the proposed reduction of credits for high school industrial arts from eight to ten credits to five. Harder explained that when industrial arts courses were offered for larger credits, they became vocational in nature and should be treated as such. In addition, it was noted by Watts, Director of Curriculum for the Department of Education, that Industrial Arts courses were not recognized by the Institutes of Technology or the Apprenticeship Board, regardless of the number of credits offered for them.

One implication of this motion was that Harder would be prepared to set up the necessary committees to accomplish the task. This he did and the Senior Industrial Arts Advisory Sub-Committee held their first meeting on September 28, 1964, with the following in attendance:

Mr. J. D. Harder	- Supervisor of Industrial Arts (Chairman)
Mr. R. H. Cunningham	- High School Inspector of Vocational Education
Mr. L. G. Hall	- High School Inspector
Mr. M. L. Watts	- Director of Curriculum
Mr. W. N. Pura	- Supervisor of Industrial Arts, Edmonton Separate School Board
Mr. B. V. Schrader	- Supervisor of Industrial Arts, Edmonton Public School Board

¹³⁰ Minutes of the Senior High School Industrial Arts Curriculum Sub-Committee, September 28, 1964, Edmonton, p. 1.

Dr. H. R. Ziel	- Head, Department of Industrial and Vocational Education, University of Alberta, Edmonton
Mr. T. M. Parry	- Supervisor of Industrial Arts, Calgary Public School Board
Mr. R. E. Blumell	- Superintendent of Schools, Hanna
Mr. A. L. Schrag	- Superintendent of Schools, County of Ponoka
Mr. S. W. Hooper	- Superintendent of Schools, County of Lethbridge
Mr. T. Smith	- Principal, Olds High School
Mr. C. T. DeTro	- Principal, Salisbury Composite High School

131

The committee discussed problems encountered in senior high industrial arts. By the second meeting held on November 31, 1964, the following tentative objectives were defined:

1. To reinforce academic education.
2. To acquire knowledge and techniques.
3. (a) To provide an opportunity for potentiality, initiative and inventiveness.
(b) To provide an opportunity for talents and self expression through creative experience.
4. To provide technical consumer education.
5. Understanding of the interrelationship of technologies.
6. To develop an understanding of the sociological problems in the technologies.
7. To acquaint the students with the demands of our technological society through the laboratory environment.
8. To develop habits and self discipline as well as desirable attitudes towards administration.¹³²

The committee generally agreed that the unit shop courses (i.e. Electricity 10, 20, 30) should be retained, particularly for larger

¹³¹ Ibid.

¹³² Minutes of the Senior High School Industrial Arts Curriculum Sub-Committee, November 31, 1964, Edmonton, p. 3.

centres, but the " . . . General Mechanics units could be clustered in lieu of offering unit shop courses."¹³³ For General Mechanics, the selected course titles were to be Woodwork, Metalwork, Electricity-Electronics, Plastics, Power Mechanics, Graphic Communications, Production Science, Research and Development and Computer.¹³⁴ A year's work was to consist of the completion of four units from the nine presented above. In unit courses, the program was to consist of 4-5 credits in the major areas. Only Power Mechanics 10, 20 and 30 along with Electricity 10, 20 and 30 were to be revised for September, 1965.

At the following meeting of this committee held on February 8, 1965, this plan was changed through a motion presented by Gallagher and seconded by Brown.¹³⁵ This motion was carried and resulted in two high school industrial arts programs being made available. One was to be the cluster program and the other Industrial Arts General. The cluster courses were identified to be Industrial Arts Electronics 10, 20, 30; Industrial Arts Materials 10, 20, 30; Industrial Arts Graphic Communications 10, 20, 30; and Industrial Arts Power Mechanics 10, 20, 30.

This organizational pattern has remained in effect and has provided two different routes for high school students. In the cluster program, a student was able to study a particular subject in depth over a three-year period. For example, he could study Electricity 10, 20, 30 in three years, receiving five credits for each course. Another student,

¹³³Ibid.

¹³⁴Ibid.

¹³⁵Minutes of the Senior High School Industrial Arts Curriculum Sub-Committee, February 8, 1965, Edmonton, p. 1.

not wishing to specialize, could study Industrial Arts General 10, 20 and 30 for three years. As this student would be studying in four areas (Power, Graphics, Electricity and Materials), his program would be broader than the student following the cluster route.

At the March meeting, objectives were further examined and finalized as follows:

1. To develop an understanding of related technological clusters and the interrelationship of technologies within the cluster areas.
2. To develop an understanding of the applications of the academic disciplines in an industrial environment.
3. To present an environment which stimulates the individual to discover and develop his interests and talents.
4. To develop an understanding of man's changing role in an advancing industrialized society. (The changing concept of work.)¹³⁶

Junior High Program

On April 28, 1964, the Junior High School Industrial Arts Curriculum Sub-Committee was called together once more in order to revise the curriculum guide. Minor changes were made and multiple-activity teaching in Alberta industrial arts laboratories was off and running.

It should not be assumed, however, that every centre in the province readily accepted multiple-activity in industrial arts. One that was very reluctant to move in this direction was the Calgary Public School Board. Junior high industrial arts at this time in Calgary was under the direction of T. M. Parry, who vigorously opposed the new approach. As a

¹³⁶ Minutes of the Senior High School Industrial Arts Curriculum Sub-Committee, March 9, 1965, Edmonton, p. 1.

result, this district continued on the unit shop type of organization until A. E. Morris, who was appointed Supervisor of Industrial Arts upon Parry's retirement in the fall of 1967, initiated a movement to phase out the old program and convert laboratories for multiple-activity instruction on a limited basis.¹³⁷

Implementation

The change to multiple-activity in Alberta made it imperative that teachers in the field become knowledgeable about the changes and be given the opportunity to learn how to organize their teaching around this method.

Harder kept the teachers informed of the changes by issuing the Industrial Arts Newsletter quite frequently. For example, in the issue printed in March, 1965,¹³⁸ he reported that 56 out of 150 schools responding to a questionnaire indicated they were using multiple-activity organization half-time or more and that 92 out of 144 teachers were using the new curriculum guide.

Summer courses in Industrial Arts 260 were offered at the University of Alberta to help teachers develop their programs for teaching multiple-activity industrial arts.

In the June, 1965 Newsletter, Harder noted that the revised junior high school curriculum guide was adopted by the Junior High School

¹³⁷At the time of writing, only 11 of 45 junior high schools in Calgary were on the new program. The remaining 34 were on the traditional program.

¹³⁸Department of Education, Industrial Arts Newsletter, Vol. II, No. 3 (Edmonton: March, 1965), p. 4.

Curriculum Committee as " . . . the basis of the program of Industrial Arts to be offered in this province starting September, 1965, and further that a transition period be allowed school systems to meet the minimum requirements."¹³⁹

Since the new guide became the one approved by the Department, teachers were admonished to become thoroughly familiar with it.

Because of the transition to the new program, many industrial arts laboratories had to be remodeled, rebuilt or new facilities provided. Each laboratory was somewhat unique and there were few that could be considered to have been built to a standard plan. There were, however, common features to be found in most laboratories. It was intended that four or six students would work together in a fairly self-contained portion of the laboratory where they would all study the same portion of the program such as Woodwork, Metalwork, Electricity, Power, etc. These areas, called bays, were to be equipped with the necessary tools, machines and furniture so that students would not have to move to other areas, but could confine all of their activities in the area to which they were assigned. In general, most of the laboratories in the province were built or renovated to follow this approach.¹⁴⁰ Frequently, Harder was called upon to provide advice for renovation or building plans and, as a result, many of the industrial arts laboratories in the province were designed by him.¹⁴¹

¹³⁹ Department of Education, Industrial Arts Newsletter, Vol. II, No. 4 (Edmonton: June, 1965).

¹⁴⁰ For examples of typical floor plans, see appendix pp. 210-216.

¹⁴¹ An examination of a binder holding laboratory plans shows Harder having planned in excess of 36 laboratories between 1964 and 1967.

In the September, 1966 Newsletter, Harder reported the appointment of A. A. Day as Assistant Supervisor of Industrial Arts. Day, who had received his Bachelor's degree from Alberta (Calgary), like Harder had a Master's degree from Oregon State University. In addition to having served as President of the Alberta Industrial Arts and Vocational Education Council of the Alberta Teachers' Association and other A.T.A. positions, Day had taught industrial arts in Calgary for seven years.¹⁴²

Harder reviewed what he considered to be major changes in industrial arts over a five-year period in the March, 1967 Newsletter. These are quoted below:

1. The multiple-activity concept of organization has been accepted.
2. Many new areas for exploration have been added and the old ones revised and this revision is continuing yearly.
3. The high school courses have been developed into two programs; the Industrial Arts General and the Industrial Arts Cluster series.
4. New equipment lists have been prepared in keeping with the requirements of the curriculum.
5. Increased laboratory areas have been approved.
6. Laboratory layouts and design are undergoing constant refinement.
7. Some textbooks have been approved at the junior high school level.
8. Student work books or manuals are being developed in the major units of the junior high.
9. An Assistant Supervisor of Industrial Arts (Mr. A. A. Day), has been appointed.

¹⁴² Department of Education, Industrial Arts Newsletter, Vol. IV, No. 1 (Edmonton: September, 1966), p. 2.

10. Closer liaison has been established between the University and the Department of Education by having the two staffs meeting jointly every month. This means the staffs in Industrial Arts of the respective departments.
11. We have been active in helping school boards and teachers plan the transition from the old to the new program. This not only includes laboratory organization but working with the specialist council in implementing workshops and institutes to upgrade the teacher.¹⁴³

Harder reported that in 1967, there were 293 industrial arts laboratories in operation, 44 of which had been built that year. There were 275 industrial arts teachers and an additional 66 teaching both industrial arts and vocational education. The total enrollment reported by the supervisor was 33,091 students. Two hundred and fourteen teachers held one or more degrees (62.4%). Of the 18,758 teachers in Alberta, 6,778 held one or more degrees (38.2%)¹⁴⁴

It is difficult to imagine the significance and scope of the change brought about in Alberta's Industrial Arts program. By 1968, there were 321 laboratories requiring 303 teachers.¹⁴⁵ Most of these facilities had been converted or built as well as equipped to offer the new program. In addition, many of the teachers attended university classes and various workshops in order to develop new techniques and skill teaching, as well as managing the new program.

¹⁴³ Department of Education, Industrial Arts Newsletter, Vol. IV, No. 3 (Edmonton: March, 1967) pp. 2-3. (See appendix pp. 217-219.)

¹⁴⁴ Department of Education, Annual Report, 1967 (Edmonton: 1968), pp. 44, 49-50.

¹⁴⁵ Department of Education, Industrial Arts Newsletter, Vol. V, No. 3 (Edmonton: March, 1968), p. 14.

Harder referred to the difficulty of the task when, in the 1968 Annual Report, he said: "The program required a reorientation of teachers to different objectives, teaching methodology, laboratory organization, course content and equipment."¹⁴⁶ He also noted that:

The new approach has received wide acceptance in this Province as manifested by the rapid growth in numbers of teachers, students and facilities. Also the many enquiries from other provinces and the United States concerning the program, suggests that it has merited the attention of others in the field.¹⁴⁷

Junior High Curriculum Guide

During 1968, a new interim curriculum guide was produced for the junior high school program. This guide was revised and became the approved guide for September, 1969. Revisions to this guide are planned for 1973.

Stated Objectives

The objectives finalized for the Alberta program were:

1. To provide exploratory experiences in various technologies prevalent in a productive society.
2. To provide a synthesizing environment for students to apply their academic knowledge in the solution of practical problems.
3. To provide a supplementary guidance function by introducing the students to the multiplicity and interrelationship of educational and occupational opportunities.
4. To provide an environment which stimulates the individuals to discover and develop their interests and talents.

¹⁴⁶ Department of Education, Annual Report, 1968 (Edmonton: 1969), p. 45.

¹⁴⁷ Ibid.

5. To develop attitudes of safety with respect for safe working habits and practices in the use of tools, equipment and materials.
6. To develop attitudes of personal and social responsibility.
7. To have students develop an organized conceptual frame of reference interrelating the knowledge of the various technologies prevalent in a productive society.¹⁴⁸

Definition

In addition to the objectives, a number of terms were defined for the industrial arts program. They are listed below:

1. Multiple-Activity Laboratory - A laboratory where three or more activities are in progress at the same time.
2. Field of Study - Field is the general title given to the basic technologies represented, e.g., materials, electronics.
3. Unit - A unit consists of from nine to twelve weeks of work in a field. There may be several units to complete a field, e.g., woods, metals, plastics, earths in the materials field.
4. Predesigned Products - Students at the junior high school level may not have the background or knowledge of tools and materials to design their own products. The teacher should exercise care in the designing of projects to best meet the objectives of the course.
5. Instruction Sheets - These are supplemental teaching materials which contain organized material for the use of individual students. There are four common types:
 - a) Operation Sheet - gives directions on how to perform a single manipulative task. This would include the directions on how to operate a machine.
 - b) Job Sheet - gives directions on how to do, completely and in proper sequence, a number of operations. The procedure for making a product or doing an experiment would constitute a job sheet.

¹⁴⁸ Department of Education, Junior High School Curriculum Guide for Industrial Arts (Edmonton: 1969), p. 3.

- c) Information Sheet - contains everything necessary for the understanding of an instructional unit which is largely informational in nature.
 - d) Assignment Sheet - directs the study to be done by the student on a lesson topic, and may include questions to determine how well a lesson has been learned.
6. Student Manual - The manual outlines in detail specific activities and assignments students are to do. This is a 'guide' for the student to follow. It includes instructions to read specified pages in reference books, to view a film-strip, to work out given problems and/or to outline the procedure for an activity.
 7. Sequential Pictorial Instruction Books - S.P.I. books provide a sequence of pictures that illustrate the sequential procedures to be followed in performing a specific operation or process.¹⁴⁹

Program Organization

The program was divided into six major fields of study: Power, Materials, Electronics, Graphics, Industrial Crafts and Developmental Research. A total of thirteen units of instruction were provided, each unit representing nine to twelve weeks of study. One unit was provided for power. Four were established for materials, namely, Woods, Metals, Plastics and Earths. Electronics was subdivided into two units, being Electricity and Electronics, and Computer. Graphics embraced Visual Communication and Graphic Communication. Three units, Leather, Lapidary and Art Metal were available in Industrial Crafts. One unit comprised the Developmental Research area.¹⁵⁰ Materials testing was to be an integral part of the program. It was recommended that in junior high schools offering Industrial Arts for three years, each student would

¹⁴⁹ Ibid., p. 4.

¹⁵⁰ Ibid., p. 5.

study at least three different units a year. In centres offering Industrial Arts on a two-year basis, a minimum of four different areas would be pursued by a student each year. Students were to spend between 120 and 175 minutes per week in Industrial Arts.

Personnel Change

In the summer of 1969, Cunningham received a leave-of-absence to undertake responsibilities with External Aid for the development of an educational program in Thailand. Harder, who had just returned from Doctoral studies at Wayne State University in Illinois, was appointed Inspector of High Schools, Industrial Education. As such, he was given the assignment by the Department to develop a coordinated program of industrial arts and vocational education in the province.¹⁵¹ This meant that he had responsibilities in both areas. A. A. Day became Supervisor of Industrial Arts.

One outcome of the Department assignment was the division of the vocational education courses into five-credit modules and the provision enabling students studying Industrial Arts at the grade X level to use this course as a prerequisite for entering senior vocational modules. This arrangement, put into effect in September, 1972, provided articulation between high school industrial arts and vocational subjects. Students wishing to articulate into the senior vocational modules would be required to devote at least 2½ credits of their high school industrial arts program to the vocational subject with which they wished to articulate. It is expected that this arrangement may change the complexion of

¹⁵¹ This responsibility was outlined in a letter Harder sent to vocational education teachers in the province in September, 1969.

the high school industrial arts program significantly in the next few years.

Methodology

In the traditional general shop, various methods of presenting material were employed such as lectures, demonstrations, quizzes, assignments, etc. However, since most or all of the students in the shop were working with the same material on similar projects (often the same project), instruction was usually given to the whole class at one time. Teachers often used the first portion of the period for the presentation of theory and had students work on projects for the remainder of the time.

This organizational pattern has not proved adequate in the multiple-activity laboratory since in any given class, a number of activities in various areas may be in operation at the same time. Tried and proven methods are still employed by the teacher, but many more instructional materials such as workbooks, filmstrips, slides, tapes, job and instruction sheets, manuals and Sequential Pictorial Instruction units are required.

The project in each system has considerable importance but in the multiple-activity laboratory is to be considered " . . . a vehicle for learning."¹⁵² The objective is not just to produce the product but is rather to use the product to teach a process.

¹⁵² Department of Education, Junior High School Curriculum Guide for Industrial Arts (Edmonton: 1969), p. 6.

Laboratory Design and Organization

The traditional junior high industrial arts laboratories were designed and equipped to offer Wood, Metal, Drafting, Crafts and Electricity. All of the students in any one class were normally required to study the same material at one time. For example, all of the students would be engaged at Woodwork at the same time. Often they all worked on identical projects. After completing the time allotted to this portion of the program, the students all proceeded to the next section, for example, Metalwork.

The laboratory for this type of program was relatively simple in design. A number of workbenches were required in addition to handtools, power tools and various pieces of equipment. The workbenches could be two or four station and, although specifically designed for Woodwork, were used for the other subjects as well. Tools were usually mounted on a tool panel located on one wall of the laboratory. Power machines (wood lathes, circular saw, scroll saw, sander, grinder, drill press) were conveniently located. Scheduling these machines sometimes became difficult as some students arrived at the same step in their project simultaneously.

Some teachers attempted to break away from this lock-step arrangement by having students work with different materials and/or on different projects at the same time. The practice of having the senior, more experienced students select or design their own projects was widespread.

One of the major ideas brought to Alberta by Ziel was organizing the laboratory into a number of distinct work stations or bays, each of

which was to be self-contained, housing all of the tools, materials, machines and equipment necessary to complete instruction in that particular field. This concept brought about significant changes to laboratory design and instructional organization. New laboratories were designed and existing facilities renovated.¹⁵³ The new configuration forced the division of a class into groups of four to six students, each group being assigned to a separate area or bay. At predetermined times, each group would rotate into a different area. With instruction going on in a number of areas, teachers had to learn to rely to a much greater extent on the use of teaching aides and prepared materials. With a strong emphasis in education in the mid-sixties being towards programmed instruction and later towards individualized instruction, the timing for multiple-activity could not have been much better.

In the high school program, similar circumstances were encountered. The most notable exceptions were in the larger urban centres where industrial arts had been offered in unit shops. Some of these facilities were converted to vocational shops and industrial arts phased out. In recent years, the trend has been away from providing vocational facilities and towards providing industrial arts senior high multiple-activity laboratories as the federal government elected to withdraw financial support for vocational facilities and a number of laboratories experienced low utilization. The Calgary Public School Board, for example, applied to have vocational facilities provided at the John Diefenbaker High School, which was to be built in 1969. This

¹⁵³ For examples of laboratory layouts, see appendix pp. 210-216.

request was turned down by the Department of Education and an industrial arts laboratory was provided instead.

New laboratories fell into one of three categories: a junior high laboratory employing one teacher; a one-teacher senior high laboratory; or a multiple laboratory requiring two or more teachers.

Recommended floor areas for the various types of facility follow:

	<u>Junior High (1 Teacher)</u>	<u>Senior High (1 Teacher)</u>	<u>Multiple Labs (2-3 Teachers)</u>
Electricity-Electronics	200	250	400
Power Mechanics	300	400	500
Graphic Communications	400	460	460
- Photography	100	100	120
Graphic Arts	150	180	200
Wood	350	500	600
Metals			
- Machine Shop			
- Welding	360	460	540
- Sheet			
Plastics	150	150	200
Ceramics	150	150	200
Materials Testing Area	100	100	200
Crafts	100	150	200
Other			
- Finishing Room	120	120	120
- Storage	240	300	600
- Offices	80	80	160
- Conference Room	200	200	300
	<u>3,000</u>	<u>3,600</u>	<u>4,800</u>

154

The recommended space for cluster areas might be allocated as follows: (each cluster requires one teacher)

¹⁵⁴ Department of Education, Industrial Arts Laboratory Planning (Edmonton: 1968), pp. 12-13.

1. Electronics	1,200	
- Storage	100	
- Office	80	
		1,380
2. Power Mechanics	2,100	
- Engine Running Room	100	
- Storage	150	
- Office	80	
		2,440 [2,430]
3. Graphic Communications	1,200	
- Storage	80	
- Darkroom	120	
- Office	80	
		1,480
4. Materials	2,400	
- Storage	400	
- Finishing Room	120	
- Office	80	
		3,000
Areas to be used in Common Research and Material Testing	400	
2 Conference Rooms @ 450	900	
		<u>1,300</u>
		9,600

In a large school offering instruction in four cluster areas the total space recommended would be 9,600 sq. ft.¹⁵⁵

Financing New Laboratories

The cost of building industrial arts laboratories and equipping them has usually required an outlay of considerable capital. Because of this, support at the Provincial Government level for many years was considered essential.

¹⁵⁵ Ibid., p. 13.

When the new program was under development in Alberta, many new laboratories were constructed and many older ones modified as the new program required larger facilities than were available under the traditional program. In order to accommodate the change, the regular grant formula was changed, enabling single teacher shops up to 3,600 square feet to be built. Prior to the introduction of the new program, most laboratories were designed with about 2,000 - 2,400 square feet of floor space. When the laboratory size was increased, the square footage grant was maintained, reaching a high of \$17 per square foot. In addition, an equipment grant of \$4 per square foot was provided. For modifications, grants were based on the area added to the laboratory.

If the actual building cost was less than the grant figure, the local school jurisdiction could use the difference to supply furniture for the laboratory. This was also regulated by a formula. If the cost of building was up to a dollar lower than the square footage grant, the whole amount (up to \$1 per square foot) of the saving was available to the board. If the cost was \$2 per square foot lower than the grant figure, then only \$1 per square foot was available for furniture.¹⁵⁶

This grant arrangement made it possible for the facility to be built, and money provided for about two-thirds of the equipment and furniture cost.

When educational financing changed to the foundation plan, the grants were modified. These changes resulted in a reduction in

¹⁵⁶ This information was obtained during a personal interview with A. A. Day, Department of Education, Industrial Arts Consultant, December 7, 1972.

laboratory size. In July, 1970, special equipment grants were cancelled.

At the present time, provincial money is still available for all school construction, including industrial arts laboratories, and is based on \$16.25 per square foot, which includes \$1 per square foot equipment grant. Responsibility for equipping the facility falls directly upon the local school jurisdiction. Estimated costs for equipping the various areas are shown below. (Figures reported are based on 1969 prices.)

<u>AREA</u>	<u>JUNIOR HIGH</u>	<u>JR. & SR. HIGH, & SENIOR HIGH</u>
Power	2,577.50	6,759.10
Metals	5,055.45	7,914.10
Woods	3,895.25	3,895.25
Plastics	3,433.10	3,433.10
Earths	1,416.57	1,416.57
Electricity-Electronics-Computer	2,316.80	4,178.80
Graphics		
1. Visual Communications		
a. Technical Design & Illustration	589.80	895.00
b. Photography	1,279.55	1,590.55
2. Graphic Communications	2,902.00	3,533.00
Industrial Crafts		
1. a. Leather	76.50	76.50
b. Lapidary	509.70	509.70
Supplementary Equipment	462.00	462.00
TOTAL	\$24,514.22	\$34,663.67

NOTE: These figures . . . vary with the quantity and type of equipment purchased which is influenced by the number of students to be served and the units to be offered.¹⁵⁷

SUMMARY

When Alberta became a province in 1905, it inherited the educational system established in the Northwest Territories. Earliest attempts at technical education had been confined to missionary attempts to provide vocational and agricultural skills for the Indians and, although Alberta had 628 schools scattered throughout the province by 1906, she lagged behind Eastern Canadian schools in the establishment of trade training facilities and programs.

Technical education in the province, however, was a reality because of the influence of the Macdonald Manual Training Plan which had brought the experimental program to Calgary. The program was considered successful and other Alberta centres followed the lead and established manual training centres.

During the 1920's, the high school program was divided into six streams: Normal Entrance, Matriculation, Agricultural, Commercial, Technical and General. One or more of these streams were available at any particular high school, and even those that did not offer full technical courses often offered manual arts programs.

There was little change in the program until 1936 when grade IX was taken from the high school program and put with grades VII and VIII to form the junior high program. In 1938, Manual Arts became General Shop and, with the change in name, there was a change in emphasis which resulted in a broader program.

A. P. Tingley was appointed provincial Supervisor for General Shop in 1941 and under his direction, Industrial Arts teachers were

encouraged to provide exploratory experiences for students and make the program less vocational in nature.

Byron, who was Tingley's successor, continued in the direction set by Tingley and stressed the role of Industrial Arts in general education. He felt that since trade training was available through the apprentice training program, Industrial Arts should provide exploratory and avocational experiences.

Byron held this supervisory position for less than two years (March, 1950 to January, 1952), after which time Mitchell took over the office. During the 1950's, the economy was expanding in Alberta and the province, mostly because of its petroleum wealth, was becoming increasingly industrialized. This may partly explain the notion held by many that the high school should contribute towards the occupational preparation of its students. This idea was particularly evident when applied to shop courses and, in 1958, a research project was conducted to evaluate the vocational effectiveness of these courses. The study concluded that about 25% of the students found vocational value in them.

By 1960, there was fairly widespread concern about the high school Industrial Arts program, particularly in large high schools where unit shops were in operation. By the spring of 1961, scathing attacks were levelled at the program, most notably in Calgary where the program was threatened with being discontinued. The realization that federal money was available for vocational education, however, brought about a complete reversal of opinion and, as a result, vocational facilities sprung up all over the province. This in turn brought about an examination of the role Industrial Arts was to play in the Alberta educational scene.

Two other events were to affect the Industrial Arts program very significantly. The first was the appointment of Ziel to the University of Alberta.

Ziel had a tremendous impact on the development of both Industrial Arts and vocational education in the province. Under his leadership, the traditional Industrial Arts program fell under severe criticism. Although many educators supported a broader range of experiences in Industrial Arts, Ziel introduced the organizational scheme and structural framework that enabled the program to become broader.

Of no less consequence was the appointment of Harder to the position of Provincial Supervisor of Industrial Arts in September, 1963 - one year after Ziel had published his ideas in The A.T.A. Magazine. Harder had the support of senior administrators in the Department of Education and, along with the thrust provided by Ziel, was able to move Industrial Arts away from the traditional program and towards the acceptance of multiple-activity.

The fact that such a radical change was brought about, to the point that nearly all centres in the province are multiple-activity laboratories, is an indication of the skill these two men had in bringing about widespread change.

Chapter IV

TEACHER TRAINING

Early Teacher Training

In the 1880's, according to Chalmers:

. . . there was no professional education for teachers in the Territories, and the Board recognized certificates granted by other jurisdictions. Certificates were classed as first, second, or third. University graduates without any professional training were granted third class certificates. . . . By 1890 . . . normal school training had become compulsory in the eastern area of the Territories.¹

Education in the Territories was influenced considerably by D. J. Goggin, principal of the Manitoba Normal School, who, in 1893, was appointed superintendent of education for the Territories. Under his leadership over eight hundred teachers received professional training during the period from 1893 to 1902. Most of this was undertaken at the normal school in Regina which was established by a grant of \$5,000 by the federal government.

One of the first acts of the new government of Alberta was to establish a normal school at Calgary in 1906. The second one opened in Camrose in 1912. At the Calgary Normal School, manual training was added to the program in 1907.² It was not until January 3, 1920, that a

¹ John W. Chalmers, Schools of the Foothills Province (Toronto: University of Toronto Press, 1967), p. 17.

² Ibid., p. 413.

normal school was opened in Edmonton, raising the total in Alberta to three.³

These normal schools were operated by the Department of Education and were quite separate from the University which had been founded in 1908. The universities in the west did not assist in teacher preparation (other than offering degrees in other disciplines) until " . . . the University of British Columbia offered a course for high school teachers in 1923 followed by the Universities of Saskatchewan (1928), Alberta (1929) and Manitoba (1935)."⁴ In Alberta, the Department maintained the control until 1945, when the training of all teachers was turned over to the University.⁵ However, licensing and certification has remained the responsibility of the Department of Education.

Manual Training and Industrial Arts Teacher Preparation

The preparation of manual training teachers, and later industrial arts teachers, was to remain in Calgary for more than half a century.

Simon notes that:

The Normal Schools and the Department of Education's summer schools at the University of Alberta continued to provide the training required for teachers of vocational subjects. During the first two years of World War I, attendance at the summer schools for teachers continued to rise. Out of a total of 2,213 teachers receiving credit in the four summer sessions 1913-16, 1,127 received credit in agriculture and gardening, industrial arts and domestic

³ Ibid., p. 418.

⁴ F. Henry Johnson, A Brief History of Canadian Education (Toronto: McGraw-Hill Book Company, 1968), p. 160.

⁵ Chalmers, op. cit., p. 429.

science courses. The number of student teachers receiving training in the manual arts declined seriously after 1916, however, probably as a result of the War.⁶

One significant development in industrial education in the province was the founding of the Provincial Institute of Technology and Art in Calgary. In 1912 the " . . . Calgary College, the forerunner of the Southern Alberta Institute of Technology was founded."⁷ The institute was opened in 1916, but between 1918 and 1920 was used exclusively to provide rehabilitation training for returning war veterans. In 1922, the institute moved to its present location on Calgary's North Hill. One half of the main building was used by the Technical Institute and the other, the west half, by the Normal School.

With the normal school being housed on the Technical Institute campus, it was logical to make facilities and instructors available for the preparation and upgrading of manual training teachers. This was undertaken and eventually led into the training of industrial arts teachers until 1964, when the program was transferred to the University of Alberta in Edmonton. It is also interesting to note that the quarters occupied by the normal school were later used as the Calgary campus of the University of Alberta, which became the University of Calgary. The quarters used on the technical school campus were turned over to the institute when the University moved to its own campus a few miles to the northwest.

⁶Frank Simon, "History of the Alberta Provincial Institute of Technology and Art" (unpublished Master's thesis, University of Alberta, Calgary, 1962), p. 15.

⁷Douglas J. Rahnell, "The History of Technical and Vocational Education in Alberta," Industrial Arts and Vocational Education Journal (Edmonton: August, 1971).

Although shop facilities were available at the technical institute, most of the manual training teachers in the province were recruited from Eastern Canada or from Great Britain. Under the leadership of Dr. Carpenter, a course for manual training teachers was opened at the "Tech." about 1932. This was the first such course offered and was re-offered in the summer of 1935. During the winter session of 1936-37, the course was again offered and continued so on a regular basis. In addition to being the principal of the Institute, Dr. Carpenter acted as an inspector for the Department of Education. He was very strongly inclined toward the general shop concept and promoted it throughout the province.⁸

One of the staff members of the Institute under Dr. Carpenter was Lindley H. Bennett. Bennett received his training in Somerset, Bristol, London, Leipzig, Guelph, Menomonie and Chicago and was instrumental in introducing manual training in Quebec and the Northwest Territories. Prior to joining the Institute staff in 1916, he taught at the Normal School in Regina. Without doubt, he had considerable impact on manual training in Alberta secondary schools, as he was very much involved with summer courses for manual training teachers.

By 1938, a number of Alberta teachers were travelling to the United States for summer school sessions which they were able to apply towards university degrees. They could not do this at the University of

⁸This information was volunteered by N. J. Cameron, L. N. Elliott and R. G. Throop, during separate interviews. These three men took courses from Dr. Carpenter and taught manual training in Drumheller, Coaldale and Calgary respectively during the 1930's. These interviews were conducted on August 14 and August 16, 1972.

Alberta. While attending Fort Collins, Colorado, some of these teachers received instruction from Emanuel E. Ericson of Santa Barbara, California, who was an advocate of industrial arts general shop. When these teachers returned to Alberta, they brought some of the industrial arts terminology and philosophy back with them.⁹

On July 26, 1940, some industrial arts teachers founded an organization called "The Industrial Arts Teachers of Alberta (I.A.T.A.)." This association, which by 1944 claimed " . . . a membership well over the hundred mark,"¹⁰ embraced " . . . teachers of industrial arts from all parts of the province and from all levels of industrial arts work in the Elementary, Intermediate and High Schools."¹¹

In December, 1944, N. J. Cameron, acting as president of the group, and L. N. Elliott, secretary, presented a brief to Dr. M. E. LaZerte, who had been appointed Dean of the Faculty of Education. In this brief, the aims and objectives, scope and extent of the Alberta Industrial Arts program were outlined. However, the major purposes of the brief were: (1) to attempt to procure credit at the University of Alberta for work accomplished at American Universities and (2) to suggest ideas for industrial arts teacher training.¹²

⁹ Personal interview with L. N. Elliott, August 14, 1972.

¹⁰ Brief to the Faculty of Education, University of Alberta. Submitted by the Industrial Arts Teachers of Alberta, December 31, 1944. Prepared by N. J. Cameron and L. N. Elliott, Calgary.

¹¹ Ibid.

¹² For the text of this portion of the brief see appendix pp. 220-221.

In this brief, the committee noted that a number of Alberta industrial arts instructors had, at great personal expense, travelled to the United States to do their degree work, a situation to them that seemed "deplorable," particularly since summer courses were available in Alberta. These courses could be used for certification but not for degree credits. This arrangement had the effect of decreasing enrollments at summer schools operated by the Department of Education.

The request made by the committee was that recognition be given to courses taken outside of Alberta and that these courses could be applied towards an Alberta degree.

Unfortunately, for the teachers involved, the University did not agree with their request for recognition of time spent at American Universities, despite the statement in the 1945-46 University Calendar:

Teachers who present transcripts covering University credits obtained outside of Alberta may be given special credit for these . . . as may be determined by the committee on admission.¹³

As a result of this decision, many of the teachers returned to the States to complete their degree work. In the 1946-47 Calendar, the University clarified its position by stating:

Few advanced credits can be given certificated teachers in the B.Ed. in Agriculture, Industrial Arts, Music and Physical Education because of the specialized nature of these programs. One or two credits may be allowed for Normal School training.¹⁴

However, their suggestions for the industrial arts teacher training program were considered in the preparation of the University of Alberta program for Industrial Arts teachers.

¹³ University of Alberta Calendar 1945-46 (Edmonton: 1945), p. 205.

¹⁴ University of Alberta Calendar 1946-47 (Edmonton: 1946), p. 224.

In the Annual Report of 1945, Tingley was enthusiastic about the role that the University was to play in teacher training.

This is a progressive educational development and, since it is the only University in Canada offering such a programme, it again marks Alberta as taking the lead in educational progress.

Industrial Arts teachers desiring to secure a degree, majoring in their own particular field, have hitherto found it necessary to attend an American Institution. This opportunity is now available in Alberta, and the impact of this development will inevitably be reflected in the type of instructional services provided by those who have participated in this program.¹⁵

The program established in 1945 provided training for the first three years only in Calgary. Students then had to go to Edmonton for the fourth and final year.¹⁶

The initial program is outlined below:

FIRST YEAR

1. Ed. 104. Principles of Education applied to industrial arts;
2. Ed. 138. English;
3. Ed. 139. Mathematics in industrial arts;
4. Ed. 142A. Industrial Arts: Mechanical drawing;
5. Ed. 142B. Industrial Arts: Woodwork;
6. Ed. 142E. Farm Mechanics;
7. Ed. 144. Physical Education;
8. Ed. 239. Science in industrial arts;

SECOND YEAR

1. Ed. 242C. Industrial Arts: Electrical;
2. Ed. 242D. Industrial Arts: Metal Work;
3. Ed. 242E. Farm Mechanics;
4. Ed. 242F. Automotive Mechanics;
5. Ed. 276. Educational Psychology;
6. Ed. 339. Industrial Arts: Historical development;

¹⁵ Department of Education, Annual Report, 1945 (Edmonton: 1946), p. 54.

¹⁶ Loc. cit.

THIRD YEAR

1. English 2;
2. Ed. 313. Consumer Education
3. One Division A, B or C option;
4. Ed. 342B. Industrial Arts: Woodwork;
5. Ed. 342C. Industrial Arts: Electricity;
6. Ed. 342D. Industrial Arts: Metal Work;
7. Ed. 342F. Automotive Mechanics;

FOURTH YEAR

1. Ed. 261. Educational Administration;
2. Ed. 460. Science and the Practice of Teaching: Shop Practice;
3. Philosophy - History of Ideas;
4. and 5. Two Division A, B or C options;
6. Ed. 492. Philosophy of Education;

Note: Five hours per week will be devoted to each shop course in industrial arts (2 hrs. lectures, 3 hrs. lab)¹⁷

The program was modified somewhat for the 1946-47 term, an outline of which follows:

FIRST YEAR

1. Ed. 102: Health and Physical Education;
2. Ed. 103: Principles of Education Applied to Industrial Arts;
3. Ed. 319-239: Mathematics and Science in Industrial Arts;
4. Ed. 142A: Industrial Arts - Mechanical Drawing;
5. Ed. 142B: Industrial Arts - Woodwork;
6. Ed. 142E: Farm Mechanics;
7. Ed. 175: Educational Psychology;
8. English 2;

SECOND YEAR

1. Ed. 202: Health and Physical Education;
2. Ed. 242B: Industrial Arts - Woodwork;
3. Ed. 242C: Industrial Arts - Electricity;
4. Ed. 242D: Industrial Arts - Metal Work;
5. Ed. 242F: Automotive Mechanics;
6. Ed. 260: (a) Mathematics, Science, English
(b) Observation and Practice Teaching;
7. Ed. 261: Educational Administration;

¹⁷ Calendar 1945-46, op. cit., pp. 210-211.

THIRD YEAR

1. Ed. 313: Consumer Education;
2. Ed. 339: Industrial Arts - Historical Development;
3. Ed. 341B: Industrial Arts - Woodwork;
4. Ed. 341C: Industrial Arts - Electricity;
5. Ed. 341D: Industrial Arts - Metal Work;
6. Ed. 341F: Automotive Mechanics;
7. One Division A, B or C option;

FOURTH YEAR

1. Ed. 460: Science and the Practice of Teaching (a) mathematics and science (b) practice teaching;
2. Ed. 492: Philosophy of Education;
3. Phil. 51: History of Ideas;
4. Two senior options from Division A, B or C.¹⁸

In addition to the basic program shown above, a special program was established for teachers wishing to specialize in order to teach Unit shops in technical schools. Those wishing admittance to this program had to have grade XII matriculation standing, journeyman certification, based on a four-year apprenticeship in an accredited trade, plus four years experience as journeymen. They were then able to " . . . qualify for a junior diploma in technical school subjects by completing one year's work in approved courses in the Faculty of Education at the University of Alberta."¹⁹ These qualifications were relaxed somewhat in later years.

Students who had completed a regular two-year program at the Institute of Technology and Art, who also held matriculation standing could, by completing one year of university training and working for

¹⁸Calendar 1946-47, op. cit., pp. 225-226.

¹⁹Ibid., p. 226.

three summers in industry, be recommended for a junior teaching diploma.²⁰ These junior diploma holders could have these changed to senior diplomas (B.Ed.) and Senior Certificates in Technical School subjects by " . . . completing six approved courses in one winter or three summer sessions in the Faculty of Education."²¹

Once the program had been established, there were few minor changes in it and it remained relatively the same for a number of years.

One interesting change in teacher certification was introduced in 1950. This did not alter the university program appreciably, but did affect teachers throughout the province.

The new legislation provided three types of teaching certificates: the Standard Elementary (Standard E), the Standard Secondary (Standard S) and the Professional Certificate. As a result of the teacher shortage, elementary and junior high teachers could be given a temporary license after completing one year of teacher training. This license could be made permanent after two years of successful teaching, upon the recommendation of a school inspector and the completion of the second year of the B.Ed. program.²²

Industrial arts teachers teaching Technical Electives in the high schools were required to hold the Senior Certificate in Industrial Arts in addition to their regular teaching certificates.²³ Junior high

²⁰Ibid.

²¹Ibid.

²²Department of Education, Senior High School Handbook: 1952-53 (Edmonton: 1952), p. 35.

²³Ibid., p. 37.

industrial arts teachers also required special certification. It is interesting to note that industrial arts teachers required a minimum of two years university training before they could teach.

In 1955, different routes of study for prospective industrial arts teachers were introduced into the university program. The Basic General Program remained essentially the same, but special programs were developed for teachers wishing to specialize in unit shops.

Route 1 was for those students:

. . . who propose to specialize in a unit shop subject in the third year and who are prepared to undertake fifteen (15) months of approved industrial experience and qualify for a certificate of apprenticeship from the Apprenticeship Board of Alberta.²⁴

They could do so only upon the recommendation of the dean.²⁵

Route 2 was designed for persons holding journeyman's certification. They were able to receive one year credit for their industrial experience and after attending university for one year, were issued an interim teaching license and specialist certificate. They could complete their degree by completing two additional university years.²⁶

Route 3 was designed:

For those who have completed an approved two-year program at the Institute of Technology and Art and who have completed a minimum of ten months approved work in industry. The same three-year program is required as in Route 2.²⁷

²⁴ University of Alberta Calendar 1955-56 (Edmonton: 1955), p. 286.

²⁵ Ibid.

²⁶ Ibid.

²⁷ Ibid.

The Move to Edmonton

The program of instruction for industrial arts teachers remained essentially the same with some minor modifications until the fall of 1963 when industrial arts instruction was made available in Edmonton. This marked the beginning of a very profound change in industrial arts teacher training in Alberta.

In the 1963-64 University of Calgary and Alberta calendars, the following statement was published: "The first three years of the Basic Program are offered only at Calgary; the fourth year at Edmonton and Calgary."²⁸

The Basic Program offered in Calgary is outlined as follows:

FIRST YEAR

1. Ed. Fdn. 201. Introduction to Education;
2. Sociology 202;
3. Ed. Psy. 276. Introduction to Educational Psychology;
4. A junior arts option;
5. Ed. I.A. 241. Mechanical Drawing;
6. Ed. I.A. 242. Woodwork;
7. Ed. I.A. 246. Metalwork;
8. Physical Education 218 or 228;

SECOND YEAR

1. English 240;
2. Ed. Adm. 261. Educational Administration;
3. Ed. I.A. 280. Educational Methods (Grades VII to XII);
4. Ed. C.I. 300. Observation and Student Teaching;
5. Ed. I.A. 341. Mechanical Drawing;
6. Ed. I.A. 244. Electricity;
7. Ed. I.A. 342. Woodwork;

²⁸University of Alberta, Calgary Calendar 1963-64 (Calgary: 1963), p. 171. University of Alberta Calendar 1963-64 (Edmonton: 1963), p. 266.

THIRD YEAR

1. Philosophy 240. General History of Thought or alternate philosophy course;
2. A junior A B C option;
3. A senior A B C option;
4. Ed. I.A. 248. Auto Mechanics;
5. Ed. I.A. 441. Woodwork;
6. Ed. I.A. 246. Metalwork;

FOURTH YEAR

1. Ed. Fdn. 492. Philosophy of Education;
2. Ed. Psy. 476. Educational Philosophy;
3. A senior A B C option;
4. Ed. I.A. 347. Auto Mechanics;
5. Ed. I.A. 344. Electricity;
6. Ed. I.A. 349. Handicraft;
7. Ed. I.A. 345. Welding²⁹

The alternate program developed under Dr. Ziel in Edmonton was considerably different in scope and direction. The four-year program offered in Edmonton follows:

FIRST YEAR

1. Ed. I.A. 203 and Ed. Adm. 261;
2. Ed. Psy. 276;
3. English 210;
4. Math 207 or 201;
5. Ed. I.A. 260;
6. Phys. Ed. 218;

Note: Ed. I.A. 203 was an introduction to industrial arts while Ed. I.A. 260 was titled General Industrial Arts and was intended to develop " . . . basic knowledge and skill in the following: ceramics, electricity, graphic arts, metals, plastics, wood; organization and management of multiple activity laboratories."³⁰

²⁹University of Alberta, Calgary Calendar 1963-64 (Calgary: 1963), p. 269.

³⁰University of Alberta Calendar 1963-64 (Edmonton: 1963), p. 293.

SECOND YEAR

1. Chemistry 230;
2. Ed. C.I. 250;
3. Physics 240;
4. Sociology 202;
5. Ed. I.A. 270;

Note: Ed. 270 was designed to develop " . . . basic knowledge and skills in the following technological areas: computer, electricity-electronics, graphic communication, materials and processes mechanical, power, organization and management of multiple activity laboratories."³¹

THIRD YEAR

1. Ed. Psy. 476;
2. Philosophy 240 or 246;
3. Physics 340;
4. Ed. I.A. 360;
5. Ed. I.A. 370;

Note: Ed. I.A. 360 was entitled Laboratory of Technology. Ed. I.A. 370 was concerned with the development of competence in computer and electricity-electronics technologies.³²

FOURTH YEAR

1. Ed. Fdn. 492;
2. Sociology 390;
3. Ed. I.A. 350;
4. Ed. I.A. 460;
5. Ed. I.A. 470;

Note: Ed. I.A. 460 and 470 were to develop competence in materials processes and power technologies (460) and develop competence in graphic communication and mechanical technologies (470).³³

³¹Ibid.

³²Ibid., p. 294.

³³Ibid.

It should also be noted that for the first time in Alberta, instruction was being given on the organization and operation of the multiple-activity laboratory.

The organizational scheme in Edmonton was to become the one followed in Alberta and, consequently, the program in Calgary was phased out. In the 1964-65 session, no further first year registrations were allowed in Calgary and the following statement appeared in the Calendar:

The Bachelor of Education in Industrial Arts Program is in the process of being discontinued at the University of Alberta, Calgary.³⁴

The curtailment of training for shop teachers in Calgary brought an end to a program begun near the change of the century, and carried out at the Institute of Technology and Art since 1932.

While the industrial arts teacher training program was experiencing this change, the new program for vocational education teachers was also aborning under the direction of Dr. H. Ziel. This program was designed to provide vocational education teachers for the new high school vocational education facilities being constructed throughout the province. Candidates for this program were to have journeyman certification and approximately five years of additional industrial experience. For this, their first year of university was granted to them and they finished the remaining three years at the University of Alberta for the degree.

The program outlined for them is as follows:

³⁴University of Alberta, Calgary Calendar 1964-65 (Calgary: 1964), p. 186.

FIRST YEAR

Trade training and industrial experience;

SECOND YEAR

1. Ed. Fdn. 201;
2. Ed. Adm. 261;
3. Voc. Ed. 301. Vocational Education;
4. Ed. Psy. 276;
5. English 210;
6. Ed. Voc. 280. Curriculum and Instruction in Vocational Education;
7. Ed. C.I. 250. Student Teaching in the Secondary School;

THIRD YEAR

1. Ed. Psy. 476;
2. Philosophy 240 or 246;
3. Ed. Voc. 350. Educational Programs and Practices in Industry and Labor;
4. Junior Arts/Science option;
5. Junior Arts/Science option;

FOURTH YEAR

1. Ed. Fdn. 492;
2. Ed. Voc. option;
3. Senior Arts/Science option;
4. Senior Arts/Science option;
5. Senior Arts/Science option.³⁵

This training program, coupled with the demand for vocational education teachers created by the rapid growth of the provincial secondary school vocational program effectively turned tradesmen away from a career teaching industrial arts.

Up until this period, a strong emphasis in industrial arts was toward trade training and industrial arts teachers were subtly encouraged to qualify for trade certification, particularly if they wanted to teach unit shop at the high school level. In many jurisdictions, high school

³⁵Ibid., p. 187.

teachers were paid more than junior high teachers. If high school students were taught by a teacher holding trade certification, these students could take advantage of apprenticeship articulation arrangements. The new industrial arts program at the university was to emphasize this aspect much less, especially since articulation was available through vocational education programs.

Summer School

Although the industrial arts teacher training program was established and operated in Calgary for many years prior to moving to the Edmonton campus, practicing teachers were able to study industrial arts subjects in summer schools. Before the University was made responsible for teacher training, summer courses were taught to manual training teachers by teachers who regularly taught in the technical high schools. Later, courses for university credit were offered at the Institute in Calgary, at the Technical High School in Edmonton and later the Institute in Edmonton. Some courses were also offered at Victoria Composite High School in Edmonton.³⁶ These arrangements made it possible for shop teachers to receive instruction and credit for their required technical courses. The academic courses were open to them at summer courses conducted at the universities.

When the industrial arts laboratories were completed at the University of Alberta, these courses were no longer offered at other

³⁶ This school, originally built in 1916, was situated where the Public School Board Offices now stand at the corner of 101st Street and 107th Avenue, Edmonton.

centres, as they were transferred to the Edmonton campus of the University of Alberta.

Workshops, Seminars, Etc.

In the December, 1964 Industrial Arts Newsletter, Harder reported that all of the Regional Councils of the Alberta Teachers' Association had conducted workshops in the fall of 1964.³⁷ These workshops conducted by the Specialist Councils were considered successful and further workshops were planned for the spring. Personnel from the University, the Department of Education and from industry, as well as Industrial Arts teachers have contributed significantly to the success of these in-service programs. As the need and interest dictate, workshops and seminars are still held in various locations at different times during the year. They have been used essentially to update subject matter knowledge.

Multiple-Activity Training

In order to provide instruction in multiple-activity laboratories, many teachers had to be trained or retrained in methods of organizing materials, programs and techniques. Industrial Arts 260 offered at the University of Alberta was designed to fill the need for such a course. A study undertaken to determine the number of Industrial Arts teachers who have taken this course in past years reports the following:

³⁷ Department of Education, Industrial Arts Newsletter, Vol. II, No. 2 (Edmonton: December, 1964), p. 4.

TABLE I

YEAR	1964	1965	1966	1967	1968	1969	1970	1971
No. of teachers teaching I.A.	295	273	333	347	303	338	386	408
No. of teachers having I.A. 260	Year Total 15 15	12 27	16 43	17 60	8 68	11 79	13 92	2 94
% of teachers having I.A. 260	5.1	9.9	13.1	17.4	22.2	23.5	24.6	23.2

(For gross figures showing teacher qualifications, industrial arts teacher qualifications and degree status of industrial arts teachers, see appendix pp. 222-223, Tables VI and VII.)

For the purpose of the following study, the province was arbitrarily divided into four geographical areas: Zone 1 - Edmonton and north; Zone 2 - Red Deer and north to Edmonton; Zone 3 - Calgary and north to Red Deer; and Zone 4 - south of Calgary.



The table indicates the distribution throughout Alberta of industrial arts teachers having had I.A. 260 training at the University of Alberta in Edmonton.

TABLE II

Geographical Distribution of Teachers Having I.A. 260 Training

ZONE	No. Teachers Having I.A. 260 ³⁸	No. I.A. Teachers	% Teachers Having I.A. 260	% All Teachers Having I.A. 260 Teaching in Zone
1	55	204	27.0	69.6
2	11	54	20.4	13.9
3	8	92	8.7	10.1
4	5	58	8.6	6.4
TOTAL	79	408	19.4	100.0

SUMMARY

The first teacher training institution in Alberta was opened in Calgary shortly after the province was founded in 1905. Teacher training was conducted in this, and later similar normal schools until 1945 when teacher training became the responsibility of the University of Alberta.

Manual training teachers usually were certificated teachers who had additional training in Manual Training. Many shop teachers desiring

³⁸ These figures were taken from the 1970-71 industrial arts teacher list and thus only include teachers who were teaching during that specific school term.

university degrees completed their professional training at universities in the United States. In 1945, it became possible for them to receive this training and subsequent confirmation at the University of Alberta.

The regular winter session program for Industrial Arts teachers was conducted at the Institute of Technology and Art in Calgary. In addition, summer courses were available, both in Calgary and Edmonton. However, this arrangement changed drastically after Ziel arrived to develop the Department of Vocational and Industrial Education at the University of Alberta. In 1963, the first Industrial Arts courses were offered at the Edmonton campus and by the fall of 1964, no further first year registrations were allowed in Calgary. Those on program in Calgary were able to complete the programs which they had started.

In addition to the change in location of the campus, a completely different philosophy of Industrial Arts was presented. Where the former program concentrated on developing trade skills in both teachers and students, the new program was to emphasize the understanding of industrial processes, industrial organization and man's place in the industrial world. This emphasis continued in Alberta for the last decade.

Chapter V

GROWTH OF THE PROGRAM

Student Enrollment

From the time manual training was first introduced (about 1900) until the present time, industrial education enjoyed a fairly steady rate of growth. While it might be interesting to investigate growth from 1900 onward, this study examined growth from 1945 until June, 1971. The year 1945 was selected because of two major factors. The first was that with the World War over, education in the province could return to normal. The second reason was the establishment of a program at the University of Alberta for the training of industrial arts teachers.

In 1945, the base year, 6,530 junior high and 1,836 senior high students were enrolled in industrial arts classes. Out of a total secondary school population of 55,345, 8,366 or 15.11% were enrolled in industrial arts.

By 1950, 8,893 junior high and 3,121 senior high students, representing 20.18% of secondary school students, were enrolled in industrial arts.

During the next five years, junior high industrial arts enrollments had risen to 13,018 (26.3% of the junior high enrollment) and high school students taking shop were reported to be 6,129 (23.4% of high school enrollments). These enrollments represented 25.3% of the total secondary school student population.

In 1960, this percentage figure was 22.5% indicating a relative drop in industrial arts enrollments.

In 1961, junior high shop enrollments reached 20,115, being 27.5% of the total enrollment in the province of 73,208. In senior high, 8,435 students were enrolled in shop courses which was 19.5% of the total high school student body. A total of 28,550 students were studying industrial education, which represented 24.5% of the secondary school student population.

The percentage of junior high students in industrial arts remained fairly constant from 1962 onwards, but the high school enrollment dropped drastically in 1965, as shown in the following table.

TABLE III
Percent Students Enrolled in I.A.¹

YEAR	Jr. High	Sr. High
1962	26.7	18.0
1963	24.8	19.0
1964	22.8	24.2
1965	24.7	10.0
1966	26.2	10.3
1967	26.9	10.7
1968	27.8	12.3
1969	28.9	10.7
1970	30.5	11.9
1971	N. A.	N. A.

¹For gross figures see Tables VIII and IX in the appendix, pp. 224-225.

This drop can be attributed to the full implementation of the new vocational program. Prior to this time, a large part of the high school industrial arts program was conducted in unit shops. By 1965, many of these facilities had been converted to vocational laboratories and, in addition, many new vocational facilities were provided. As a consequence, many industrial arts programs were phased out and students were transferred to vocational courses. It is interesting to note a slight upward tendency for the last three years reported.

It should also be noted that the figures given may be somewhat misleading since all figures are based on total enrollments, which includes both boys and girls. In the Industrial Arts program, most of the enrollments would be made up of boys. Hence, if only boys were considered in the study, the percentage figures would be about twice as high. It is felt, however, that the important information is the relative growth position of industrial arts enrollments to other growth records.

The following table shows the relationship between Industrial Arts enrollments and school enrollments for the secondary school population (grades VII through XII):

TABLE IV
Students Enrolled in I.A.²

YEAR	I.A. Population	Jr.-Sr. Population	% I.A. Enrollment
1962	30,191	124,043	24.3
1963	29,859	129,852	23.0
1964	25,409	137,524	18.5
1965	28,604	146,284	19.6
1966	31,464	153,084	20.6
1967	32,590	159,835	20.4
1968	35,854	168,535	21.3
1969	37,233	179,054	20.8
1970	40,924	187,583	21.8
1971	40,911	195,559	20.9

²For other figures, see Tables VIII and IX in the appendix, pp. 224-225.

Another measure of growth is indicated by the number of industrial arts laboratories in operation each year. A further indication would be the ratio of industrial arts teachers to other teachers. The following table shows these relationships:

TABLE V

Relationship Between Number of I.A. Labs and
I.A. Teachers Compared to Total Teachers³

YEAR	No. Labs In Operation	No. I.A. Teachers	Total Teachers	Ratio I.A. to Total Teachers
1962	311	288	13,342	1 : 46.3
1963	306	274	14,376	1 : 52.4
1964	309	295	15,747	1 : 53.4
1965	288	273	16,139	1 : 59.1
1966	324	333	16,364	1 : 49.1
1967	293	347	18,758	1 : 54.1
1968	307	303	19,858	1 : 65.5
1969	341	338	21,577	1 : 63.8
1970	383	386	22,726	1 : 58.9
1971	397	408	22,870	1 : 56.1

An examination of the right-hand column shows that in 1962, there was one industrial arts teacher for 46.3 other teachers, the lowest the ratio had been in the decade. The highest ratio occurred in 1968 when it was one industrial arts teacher to 65.5 other teachers in the province.

³See Table X in the appendix, p. 226.

The number of laboratories in operation is shown in the following graph:

GRAPH I

Number of Laboratories in Operation 1962-1971⁴



⁴For details, see Table XI in the appendix, p. 227.

Laboratories Offering Multiple-Activity

One significant statistic for this study would be the number of industrial arts laboratories offering the multiple-activity program. Unfortunately, the data showing the number of laboratories for any given year is not available. However, during the 1970-71 term, a total of 325 laboratories were able to offer multiple-activity industrial arts. This figure represents 86.9% of the laboratories in use during that year. Multiple-activity was defined for this data as being three or more units per year for a minimum of two years, making a total of six different units.⁵

⁵This information was obtained from the records of A. A. Day who, in 1971, was Supervisor of Industrial Arts for the Department of Education in Edmonton.

Chapter VI

SUMMARY AND CONCLUSIONS

SUMMARY

Philosophy and Objectives

One problem that has existed through the years in the industrial education field has been the development of a philosophy that could successfully balance the general education objectives and the more specific vocational objectives.

In the early years in Alberta, the industrial education program was largely geared to vocational objectives which emphasized trade skill development. Furthermore, this training was confined primarily to woodwork, drafting and metalwork. This is quite understandable when the geographic location and industrial development of the province is considered. Alberta prior to the 1930's was essentially an agricultural area. Most of the industry in the province was tied to the farm economy, a condition where skills in woodwork and metalwork would be very useful assets to almost any boy raised in this type of community. As the range of industrial pursuits expanded in the province, the desirability of offering a broader program became evident and indeed was proposed by leaders in the field in the late thirties.

This awareness paralleled a similar change in educational thought spearheaded by Bennett in 1919 when he advocated the inclusion of graphic arts, mechanic arts, plastic arts and bookmaking arts in his proposed manual training program. Bennett was aware of the changes that were being

made in the industrialized Eastern centres of the United States, which no doubt helped him form a frame of reference for the development of his philosophical outlook.

Industrial development was relatively late in coming to Alberta, but was hastened by the discovery of oil, World War II and the subsequent development of the thriving oil industry in the post war years. During the time industry became more prevalent and diversified in the province, the development of broad-based goals and broad experiences in industrial education programs also took place.

Educational leaders in this field, including Tingley, in the early forties advocated that the emphasis in industrial arts shift away from specific skill development and move towards experimental experiences and avocational interests.

Despite their efforts, little real progress was made in developing a truly broad program incorporating studies in many fields until the early 1960's.

This lack of acceptance undoubtedly was based on many factors, one of which may have been the rather pragmatic outlook forced on many Albertans by economic and social conditions. The depression of the thirties with its widespread unemployment brought many families face-to-face with poverty, which unquestionably emphasized the desirability of having saleable job skills.

The war following the depression further emphasized the envious employment opportunities of the trained and skilled workers. They commanded the highest pay and enjoyed the most secure positions. For Albertans who had experienced difficult times, specific job training would appear attractive and desirable.

Both Ziel and Harder had difficult tasks to perform in order to bring about major changes in industrial arts philosophy and objectives within the province. As far back as the mid 1940's, Tingley was aware of the direction that industrial arts should move towards. However, he was not able to implement a completely new program for Alberta. His successors, Byron, Mitchell and Cunningham, did not advocate a radical departure from the program being offered in Alberta, which in the high schools was mostly trade centred. Many of the industrial arts teachers in the province also had trade orientation to the discipline which was due to their professional training, a large part of which may have been received at the Institute of Technology and Art in Calgary or from senior industrial arts teachers teaching in summer schools.'

A significant change in the program was the one brought about indirectly by the signing of the Technical and Vocational Training Agreement in 1961. Most Alberta educators had no means of seeing the impact that this agreement was to have in the province. An examination of the entire field of industrial education was undertaken with the first phase concentrating on the high school program. Along with this examination, industrial education teacher training was to move to the Edmonton campus of the University of Alberta and be placed under the direction of Ziel.

Ziel is usually given credit for introducing multiple-activity to Alberta. His proposed program encompassing grades VII through XII was organized into four distinct divisions or phases. The first phase would be carried out in multiple-activity laboratories and would introduce grade VII students to tools, machines and materials, with the purpose of having the students develop an appreciation for them.

The second phase would introduce students to the various technologies prevalent in the work world. Grade VIII and IX students were to receive this experience.

Phase three, reserved for grade X students, would expose the students to the demands imposed by industry and commerce. The final phase, entered only by those wishing to pursue industrial studies, would provide in-depth studies in two or three areas and would emphasize problem-solving through research and development type activities.

Ziel's proposed program received support both at the University and the Department of Education. The two most influential officials supporting him were Dr. Coutts, Dean of the Faculty of Education and Dr. Byrne, then Chief Superintendent of Schools for the Department of Education. There is a strong possibility that Coutts and Byrne were aware that changes should be made in the Alberta program and the proposals outlined by Ziel were readily acceptable to them. However, substantiating documentation for this has not been discovered.

Once Ziel had the support of these senior officials, his philosophy had to be spread within the province. He outlined his ideas at public meetings, meetings with industrial arts teachers and through publications such as articles in The A.T.A. Magazine.

When Harder accepted the position of Supervisor of Industrial Arts in 1963, he examined the program proposed by Ziel and since the multiple-activity concept became the official program in Alberta, being developed under Harder's direction, it is concluded that the philosophies held by these two men must have been fairly congruent.

Teacher Preparation

In 1945, teacher training became the responsibility of the University and all teachers in training came under the auspices of the Faculty of Education. It was not until Ziel arrived on the scene that a separate department was organized for industrial arts and vocational teachers. Prior to this time, industrial arts teachers were on a program similar to all other teachers, except that they received their basic shop training off of the University campus.

This single factor is a very significant one. When teacher training was offered in Calgary, prospective industrial arts teachers took regular courses in education, arts and sciences, and came under the same administration as all education students. These courses were taught by regular university professors, a number of whom held doctorates in their various fields of specialization.

When the students went for their industrial arts courses, however, they left the University scene and went to shop areas where they received instruction from instructors who, although being experts in their field, may have had little university training (in some cases, none) or perhaps held at the most, one degree. Although this arrangement seemed to work well, it did nothing to enhance the prestige of industrial arts.

This division in instruction must also have caused other problems, particularly at the Institute of Technology and Art where the emphasis in the various shops was on transmitting trade skills and related knowledge. There was little opportunity for research or the investigation and application of learning theory as applied to industrial arts studies. No provision for exploration in fields other than woods, metals, drafting, arts and crafts, electricity and automotives was made.

When industrial arts teacher training moved to the Edmonton campus, students were able to stay on the campus, were taught by men holding graduate degrees in the discipline and were encouraged to broaden their understanding of the industrial world.

One serious problem that has remained has been the University's lack of appeal for industrial education students in the southern part of the province. Most of the students enrolling and graduating from the program come from and get employment in the northern part of Alberta. Many of the teachers in southern Alberta received their industrial arts training in the United States, which is assumed may have been considerably different than the program offered in Alberta.

Facilities

Under the traditional program, shops were fairly easy to plan and equip. Many basic hand tools were required along with few machines, particularly in junior high schools. In high school unit shops, many machines were required, each serving the same function, i.e. machine lathes in the machine shop. The multiple-activity approach forced new shop plans to be developed and a different approach to equipment selection to be used. Instruction and classwork was to be conducted in bays and many different activities were to be conducted simultaneously. The key to good laboratory organization was to be flexibility. Teachers began to experiment with various layouts of bays and organizational patterns. Since programs were to be offered in areas never before taught in Alberta, new equipment had to be purchased and evaluated, new sources of supplies had to be discovered and ways of using materials investigated. Along with this, the problem of equipment obsolescence arose as new industrial techniques were devised.

Once a traditional type of shop had been equipped, very little capital was required to operate it, apart from periodic maintenance and replacement of worn-out or damaged equipment. With the move to multiple-activity with studies being conducted in many areas, the probability of equipment obsolescence became more acute. One example of this would be the movement away from the use of platten presses in printing, a process being replaced by offset lithography. Some of the early multiple-activity laboratories had walls separating various areas, however, the current trend is to keep interior walls to the minimum, creating a large open area in which furniture and equipment can be easily relocated, maximizing the flexibility of the facility.

Implementation

When the program first began to be developed, Cunningham was the Supervisor of Industrial Arts for Alberta. However, heavy responsibilities in the vocational education area used most of his time. Upon the resignation of McDougall, then acting as Supervisor, Harder joined the Department in September, 1963, as Supervisor of Industrial Arts. Under his direction, multiple-activity was phased in.

Harder's first task was to evaluate the program then being operated in the province which he did by visiting most of the industrial arts laboratories in Alberta. The University pilot project at Hillcrest was also carefully observed. Once determining the direction to be followed, he set up the necessary curriculum committees which undertook course revision. Harder realized that in order to implement the changes advocated, support from senior administrators was required. In a review of the progress made by 1967, Harder said, 'Let us not kid ourselves,

without the cooperation of the top education administrators no program can move.¹

CONCLUSIONS

The conclusions presented are mostly based on material researched for the study. However, the writer recognized that, since he was an industrial education teacher in the province and was closely associated with a number of men referred to in the study, his objectivity has been colored to some degree. As a consequence, the following conclusions may reflect some of the writer's opinions and biases.

Philosophy and Objectives

Many educational philosophers have advocated the inclusion of practical subjects in the school curriculum, not only because they might have some vocational value, but, in addition, have importance in the realm of general education. The balance between the vocational and general education objectives has been a problem throughout most of the history of industrial education. It also appears that broad-based industrial education programs are more readily accepted when the local economy is based on a fairly diversified industrial foundation.

In Alberta, it would appear that the broad-based, multiple-activity program has been widely accepted by administrators, teachers, students and the community, most particularly at the junior high school level. Vocational education programs at the senior high school level are available for those wishing in-depth study.

¹Department of Education, Industrial Arts Newsletter, Vol. VI, No. 3 (Edmonton: March, 1967).

A study determining exactly how well the multiple-activity program is accepted by various groups would be beneficial and should be undertaken.

Teacher Preparation

The provision of suitable training for industrial education teachers has been a serious problem throughout the years. In Alberta, the Macdonald Training Plan was the first to provide special teacher training. Later, Manual Arts teachers were trained at various centres, but it was not until 1945 that the University of Alberta accepted responsibility for the training of Industrial Arts teachers, which was provided in Calgary. The program offered in 1945 at the Institute of Technology (in conjunction with the University of Alberta) remained trade and skill centred until 1963, when it was moved to Edmonton and placed under the direction of Ziel and his associates at the campus of the University.

With the University training industrial arts teachers and the Department of Education being responsible for program development and implementation, very close liaison and cooperation is necessary between these two bodies. Some of the structure for this cooperation exists, but the tendency to be autonomous often seems to be the more dominant mode. The program outlined by Ziel and offered at the University is not completely congruent with the program developed by teachers in the province. Efforts should be made by these institutions to move closer together in terms of program development and teacher preparation.

Industrial arts teachers are required to be very knowledgeable about a great many industrial processes and, since technology is changing

so rapidly, may experience considerable difficulty in keeping this knowledge current. In addition, regardless of how broad the program, they are expected to be able to demonstrate considerable skill when using the machines, tools and materials in the laboratory. Unfortunately, no formal accredited program is available for upgrading skills and knowledge after the university degree program has been completed. Teachers can and do attend workshops and seminars, but this is usually on their own time and at their own expense. They are also able to enroll at the Northern and Southern Alberta Institutes of Technology for the odd course offered in the summer, or, if they live in or near Calgary and Edmonton, can enroll in some type of evening program. Unfortunately, these courses do not receive university recognition towards any degree. The teacher who has completed the baccalaureate degree wishing to further study materials and processes cannot do so at the graduate level. It is recommended that thought be given to the assignment of university credit for some courses that could be offered at either of the Institutes of Technology. These courses could and should be very carefully structured under the direction of the Department of Industrial and Vocational Education at the University of Alberta.

The technical world is becoming increasingly more sophisticated and complex. In addition, its expansion is involving larger and larger segments of the population to a greater depth. In order to keep up with the ever-changing technology, teaching and learning in industrial arts laboratories will, of necessity, have to become more efficient. Programs will need to become more individualized and the curriculum more flexible. Increasing use of audio-visual materials such as slides, audio-tapes, filmstrips, loop films, movies and television will have to be made. These

can be powerful teaching tools and will have to be used more extensively. Communication skills will receive new emphasis and, since for many students industrial arts is extremely interesting, the motivational aspect of the program can be used to assist students with reading problems. This means, of course, that industrial arts teachers will require some expertise in remedial reading. Consideration should be given to the provision of some training in this area during their university work. It is not expected that they will become reading specialists, however, some diagnostic and remedial work could be done by them.

Facilities

Multiple-activity laboratories were in operation in Clinton County, Ohio² as early as 1937. However, although general shops were organized in Alberta, it was not until 1963 that multiple-activity laboratories began to be developed in the province and by 1971, 86.9% of operating laboratories were multiple-activity. It is expected that flexibility will continue to be emphasized in laboratory design, so that expensive facility renovations will not have to be undertaken as new processes are taught or as the program is revised.

Implementation

Although it is extremely difficult to document the exact methods used to implement the program, it might be fruitful to examine the course

²See page 37 of study and appendix p. 176.

of action undertaken using Richard Burns' guideline for involving teachers in the development of new instructional programs.³

1. Work initially with a small select staff.

Harder did this by working with various relatively small curriculum committees which were composed of:

- a) a Department of Education representative
- b) a member from the University
- c) teachers selected from names approved by the Alberta Teachers' Association

The criteria used for their selection were:

- a) They had to be knowledgeable in the subject area.
- b) They must have been successful teachers.
- c) They had to be productive committee members. In addition an attempt was made to select them so that geographic areas had representation and both the public and separate systems were equitably represented.

2. Try to select a staff of young, eager, interested, innovative persons who are eager to get ahead.

Unquestionably, Harder's travels in the province helped identify these types of teachers and most committee members fell into this category.

3. Select a problem that is generally recognized as such so that the idea of change will be more readily accepted.

(Not applicable)

³ Richard W. Burns, "Suggestions for Involving Teachers in Innovation," Change and Innovation in Elementary and Secondary Organization, eds. Maurice Hellson and Ronald T. Hyman (New York: Holt, Rinehart and Winston Inc., 1971), pp. 421-423.

4. Select a project that can be handled easily. Often a small pilot project should be the first step.

The project was of a magnitude that could not be handled easily. However, the pilot project at Hillcrest provided valuable information.

5. Pick an area of instruction that is easily structured.

Most areas in a multiple-activity laboratory lend themselves readily to structuring. Instructors were fortunate in having a number of areas from which to make the selection of units they would offer.

6. Provide your staff with a library of handy reference material relating to all aspects of the problem.

An extensive industrial education library was available at the Department of Education. Publishers were eager to provide materials for committee members. Newsletters from the Department carried titles of publications available on a loan basis from the Department library.

7. Hold planning sessions as necessary.

For this program, the planning committees would be the Curriculum Committee and the various ad hoc committees. However, workshop planning sessions were conducted through the A.T.A. Specialist Council. Special planning sessions were conducted in various school jurisdictions when necessary.

8. Hold frequent, but short, staff meetings.

(Not applicable)

9. Do not 'nit-pick' - keep the major problems in focus.

This was one of Harder's strong points and probably contributed significantly to the success of the program implementation.

10. Reward the staff involved.

The rewards allotted are difficult to determine. Release time was provided for teachers to attend curriculum committees and a very

minor, if not insignificant honorarium paid to committee members. The major reward was probably being able to have a voice in the change process.

11. Give credit as often as possible, preferably publicly, to those involved.

In Industrial Arts Newsletters, publicity was given to teacher efforts with short articles about the teachers involved in curriculum work. Thanks were extended in these newsletters for the efforts put forward.

12. Fix the responsibility - everyone should be clear about their share of the responsibility and the goals they are to reach.

Definite assignments were made at each curriculum meeting.

13. Set definite time limits.

Time limits and target dates were set and quite clearly adhered to.

14. Short-term goals and short-term time limits, sequentially assigned, are preferable to complex goals and long time limits.

Complex goals and long time limits were established by Harder and presented to committee members. However, work was broken down into small units to be accomplished in short-term time limits.

15. Do not rush the project.

This is a relative type of a measure. Undoubtedly, some critics would say the project was too rushed, while others would feel implementation could have been speeded up.

16. Do not burden the staff with clerical work, trivial chores, non-essential reports, and tasks that a less expert person can do.

This was mostly beyond the scope of the Department. Reports and materials were submitted to the Department for final typing and reproduction.

17. Encourage the staff to elect or select areas of responsibility whenever possible, as such areas (tasks) of interest are more readily pursued than are arbitrarily assigned tasks.

This was done.

18. Encourage all types of communication between members and between levels. Encourage suggestions and permit free, constructive criticism. Get all the 'feedback' possible.

At curriculum meetings, this type of communication was encouraged.

Teachers in the field were invited through the Newsletter to submit criticisms and suggestions. In the March, 1965 Newsletter, Harder reported the results of a questionnaire sent out in January of that year which indicates that he sought and received feedback.

19. Training of a staff can be accomplished best by face-to-face or crosstable communication with 'experts' and 'advisors,' rather than a more formal teacher-structured or academic approach.

(Not applicable)

20. Be flexible, and when errors occur, correct them. The best plans are not perfect; so, change plans when necessary. Deadend roads will occur; and when they do, do not hesitate to scrap one idea in favor of another.

Unquestionably, Harder has maintained a position of flexibility.

21. Encourage production.

Strong emphasis was put on production so that viable evidence was available indicating that the program was progressing and was proving successful.

22. Provide for helpful supervision. Supervisors should be resource persons rather than merely overseers.

This was the position adopted by Department personnel who acted as consultants as well as providing direction. There was no doubt that since Harder was directly responsible for the program's development and success, final decision making rested with him.

During a lecture Harder gave to prospective industrial education teachers at the University of Alberta during the summer of 1972, he reflected upon the method of bringing about change which was used during the revision of the whole provincial industrial education program. This change began with the publication of his "A Rationale for Industrial Education," produced in the early spring of 1970 and changes are still undergoing development.

Although his remarks at the University were directed towards recent changes in industrial education and not specifically multiple-activity industrial arts, the portion dealing with the dynamics of change is reproduced below as an illustration of the type of organization used to effect change in direction.

There are five generally recognized steps in bringing about change. While we did not consciously think of these at the time, reflection on the process just completed revealed that we had in fact followed them rather closely.

1. Awareness Stage - Recognizing the Need for Change

Someone must provide the stimulation. Normally this person has contact with research and development sources. In the Department the evaluation team of High School Inspectors and Consultants had become aware of the problems and provided the stimulation to arouse those people in the field associated with vocational education.

The first step was to study what had happened in the past seven years and relate this to current research and developments. On the basis of this information I wrote "A Rationale for Industrial Education." This document became the vehicle for the next step in the change process - that of

2. Creating Interest

To create interest, information must be provided. We had committees studying duplication of course content between Industrial Arts and Vocational Education as well as within each of the programs. We set up experimental programs in four schools to provide more information. This by the way, released a tremendous amount of energy on the part of teachers and administrators

who found themselves in the center of action. They drew on their creativity to organize content and schedule classes on the basis of student interest and time. The information derived from these courses was publicized through our Industrial Education Newsletter, sent to all Industrial Education teachers, principals and superintendents. Also, Mr. Day, Mr. Smith and myself met with most of the teachers in one situation or another during the year. In addition, we spoke at meetings of the principal associations, superintendents and convention groups. An important event in this communication was a two-day seminar in Red Deer sponsored by the Industrial Arts and Vocational Education Specialist Council of the Alberta Teachers' Association. It was designed to provide for interaction between those that were aware of the need to change and had ideas, and those that resisted change of any kind. During the time that interest was being stimulated the third step in the change process was being applied, namely;

3. Evaluation

The results of the experimental program were published after one year of operation. Individuals involved in these programs (about 30 teachers plus administrators) were adding their voices in support of the advantages. Our efforts were now directed to reducing the disadvantages of moving to the change. The grant structure was modified to sweeten the pot for the innovators; double programming was allowed; the provision of materials, both softwear and hard, was encouraged to make it easier for the teacher to adapt. Once the teacher felt that the advantages outweighed the disadvantages he was ready to move to the trial stage.

4. Trial Stage

Less than a year after the stimulation of the awareness level we had requests from many individual teachers and principals to allow them to move to the new approach. However, we were not ready for a wholesale change. Consequently, we limited the schools trying out the new ideas. Five schools were added to the four already in.

To implement the changes suggested required a lot of content revision. Committees began work in the fall of 1971 and by October, 1972, will have completed their work in five of the seven career fields.

5. Adoption

The basic program philosophy was adopted by the Secondary School Curriculum Board early in the process. This cleared the way for revisions. The new content is available to the teachers and will be presented for formal adoption by the Secondary School Curriculum Board in November. The methodology and

teaching strategies will take longer. Adoption occurs only when the individual teacher is convinced that the new idea is better than the old one and begins to use it regularly.

In summary these are the steps again:

1. Through knowledge of the field, research, experiences and a sensitivity to current developments a person, usually in a key position, becomes aware of the need for change and takes deliberate steps to get it started.
2. The change is discussed with others and interest created through provision of information.
3. The changes are evaluated and compared with the old and if advantages outweigh the disadvantages other teachers try it.
4. If the trial of the change proves satisfactory the new approach will be adopted.
5. The adoption stage must then be supplemented with intensive refinements to maintain the advantage.⁴

The preceding organizational scheme was followed when developing instructional modules in the vocational field. However, it is assumed a similar type of approach was used when bringing multiple-activity to Alberta.

It should not be concluded that the development of multiple-activity in Alberta was brought about entirely by Ziel and Harder. These men provided impetus and leadership but they also received considerable support from others. Ziel was able to call upon the experience and service of men within the University; Harder, on the other hand, drew upon the resources of teachers in the field. He was also assisted by A. A. Day who, in addition to being a veteran industrial arts teacher, had extensive experience in Alberta Teachers' Association work. His

⁴Jacob D. Harder, "History and Development of the Alberta Industrial Education Program" (paper given to I.Ed. students at the University of Alberta, summer, 1972, Edmonton), pp. 14-18.

philosophical position matched Harder's and, as a result, they were able to operate as a cohesive team.

One very real difficulty encountered in program implementation was the lack of experience and training in multiple-activity laboratories by the teachers in the field. The problem was further compounded with the University offering a training program that did not exactly match the program being developed provincially.

The financial pressure may bring about a change in the teachers' role. It is expected that in larger centres, increasing use will be made of lower salaried teacher aides and the professional industrial arts teacher will become a laboratory and program director who will develop learning packets for groups and individual students, will evaluate learning outcomes and will provide diagnostic-remedial services. If this in fact develops, care will need to be exercised that personal contact with students is not lost.

Finally, it is concluded that the relatively high cost of offering industrial arts, partly due to low student/teacher ratios, will keep the program under constant surveillance and criticism which may ensure a healthy program geared to the times.

BIBLIOGRAPHY

A. Books

- American Council of Industrial Arts Supervisors, Industrial Arts Education. Millersville, Pa.: American Industrial Arts Association, 1963.
- Anderson, Lewis F. History of Manual and Industrial School Education. New York: D. Appleton and Company, 1926.
- Barlow, Melvin A. History of Industrial Education in the United States. Peoria, Illinois: Chas. A. Bennett Co., Inc., 1967.
- Bennett, Charles A. The Manual Arts. Peoria: The Manual Arts Press, 1919.
- _____. History of Manual and Industrial Education Up to 1870. Peoria: The Manual Arts Press, 1926.
- _____. History of Manual and Industrial Education 1870-1917. Peoria: The Manual Arts Press, 1937.
- Bonser, Frederick G. and Lois C. Mossman. Industrial Arts for Elementary Schools. New York: The Macmillan Company, 1936.
- Chalmers, John W. Schools of the Foothills Province. Toronto: University of Toronto Press, 1967.
- Dewey, John. The Child and the Curriculum and The School and Society. Chicago: The University of Chicago Press, 1956.
- Downey, Lawrence W. and Ruth L. Godwin (eds.). The Canadian Secondary School: An Approach and a Forecast. Toronto: The Macmillan Company and W. J. Gage Ltd., 1963.
- Ericson, Emanuel E. and Kermit Seefeld. Teaching The Industrial Arts. Peoria: Chas. A. Bennett Co., Inc., 1960.
- Gerbracht, Carl and Robert J. Babcock. Elementary School Industrial Arts. New York: Bruce Publishing Company, 1969.
- Hellson, Maurice and Ronald T. Hyman (eds.). Change and Innovation in Elementary and Secondary Organization. 2d ed. New York: Holt, Rinehart and Winston, 1971.
- Johnson, F. Henry. A Brief History of Canadian Education. Toronto: McGraw-Hill Book Company, 1968.

- Johnson, William H. and Isadore M. Fenn. Fundamentals of Industrial Arts and Vocational Education. Chicago: Goodheart-Willcox Inc., 1943.
- Kidd, Donald M. and Gerald B. Leighbody. Methods of Teaching Shop and Related Subjects. Albany: Delmar Publishers, 1955.
- Miller, Rex and Lee H. Smalley. Selected Readings for Industrial Arts. Bloomington, Illinois: McKnight and McKnight Publishing Company, 1963.
- Mouly, George L. The Science of Educational Research. New York: Van Nostrand Reinhold Company, 1970.
- New Directions for Industrial Arts. Addresses and Proceedings of the 26th Annual Convention of the American Industrial Arts Association. Washington, 1964.
- Olson, Delmar W. Industrial Arts and Technology. Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1963.
- Phillips, Charles E. The Development of Education in Canada. Toronto: W. J. Gage Ltd., 1957.
- Silvius, G. Harold and Ralph C. Bohn. Organizing Course Materials in Industrial Education. Bloomington, Illinois: McKnight and McKnight Publishing Company, 1961.
- _____ and Estell H. Curry. Managing Multiple Activities in Industrial Arts. Bloomington, Illinois: McKnight and McKnight Publishing Company, 1971.
- _____ and _____. Teaching Multiple Activities in Industrial Education. Bloomington, Illinois: McKnight and McKnight Publishing Company, 1956.
- _____ and _____. Teaching Successfully in Industrial Education. 2d ed. Bloomington, Illinois: McKnight and McKnight Publishing Company, 1967.
- _____ and _____. Teaching Successfully the Industrial and Vocational Subjects. Bloomington, Illinois: McKnight and McKnight Publishing Company, 1953.
- Snedden, D. and W. Warner. Reconstruction of Industrial Arts Courses. New York: Teachers College, Columbia University, 1927.
- Travers, Robert M. W. An Introduction to Educational Research. 3d ed. New York: The Macmillan Company, 1969.
- Van Dalen, Deobold B. Understanding Educational Research, An Introduction. Enlarged/revised. New York: McGraw-Hill Book Company, 1966.

Vocational Education in Canada. Ottawa: Department of Education, Queen's Printer, 1949.

Wiersma, William. Research Methods in Education, An Introduction. Philadelphia, New York: J. B. Lippincott Company, 1969.

Wilber, Gordon O. Industrial Arts in General Education. 2d ed. Scranto, Pennsylvania: International Textbook Company, 1954.

Ziel, Henry R. Man Science Technology -- An Educational Program. Edmonton: I.D.B. Press, 1971.

B. Periodicals

The Calgary Albertan, December 31, 1960.

The Calgary Albertan, April 15, 1961.

The Calgary Herald, April 8, 1961.

The Calgary Herald, October 13, 1961.

The Calgary Herald, November 17, 1961.

Olson, Delmar W. "A County Arts and Industries Program," Industrial Arts and Vocational Education Magazine, School Shop Annual, March, 1941.

Rahnell, Douglas J. "The History of Technical and Vocational Education in Alberta," Industrial Arts and Vocational Education Journal, August, 1971.

Robertson, James W. "The Macdonald Manual Training Schools," Canadian Magazine, XVI, 1901.

Warner, William E. "A Perspective of Industrial Arts," American School Board Journal, 89:12, August, 1934.

Ziel, Henry R. "Industrial Arts and Vocational Education in a Changing Society," The A.T.A. Magazine, Vol. 43, No. 1, September, 1962.

Ziel, Henry R. "Industrial Arts and Vocational Education in a Changing Society," The A.T.A. Magazine, Vol. 43, No. 3, November, 1962.

Ziel, Henry R. "A New Concept of the Industrial Arts Program," The A.T.A. Magazine, Vol. 43, No. 6, February, 1963.

C. Unpublished Works

- Byrne, Timothy C. "The Historical Development and An Evaluation of Provincial Leadership in the Field of High School Instruction for the Province of Alberta." Unpublished Doctoral thesis, The University of Colorado, Denver, 1956.
- Cameron, N. J. Personal interview. August 14, 1972.
- Day, A. A. Personal interview. December 7, 1972.
- Driedger, Peter P. "A Comparison of the Industrial Arts Program of Saskatchewan to Four Other Industrial Arts Programs." Unpublished Master's thesis, University of Alberta, Edmonton.
- Elliott, L. N. Personal interview. August 14, 1972.
- Gallagher, James E. "A Descriptive Analysis of Industrial Arts in Alberta." Unpublished Master's thesis, University of Alberta, Edmonton, 1963.
- Goresky, Isidore. "The Beginning and Growth of the Alberta School System." Unpublished Master's thesis, University of Alberta, Edmonton, 1944.
- Grywalski, Stan. "A History of Technical-Vocational Secondary Schools of Alberta." Unpublished Doctoral dissertation, University of Oregon, Eugene, 1972.
- Harder, Jacob D. "The Development of the Industrial Arts Program and Its Present Status in the Province of Alberta." Unpublished Master's thesis, Oregon State University, Corvallis, 1964.
- Harder, Jacob D. Personal interview. September 20, 1972.
- Perrin, A. M. K. "The Development of Industrial Arts Education in the Province of Alberta." Unpublished Master's thesis, Oregon State College, Corvallis, 1951.
- Simon, Frank. "History of the Alberta Provincial Institute of Technology and Art." Unpublished Master's thesis, University of Alberta, Calgary, 1962.
- Throop, G. R. Personal interview. August 16, 1972.
- Walker, Bernal Ernest. "Public Secondary Education in Alberta." Unpublished Doctoral dissertation, Stanford University, California, 1955.

D. Department of Education Publications

Alberta Industrial Arts Equipment List. Department of Education, Edmonton, 1969.

Annual Report, 1906. Department of Education, Edmonton, 1907.

Annual Report, 1945. Department of Education, Edmonton, 1946.

Annual Report, 1950. Department of Education, Edmonton, 1951.

Annual Report, 1952. Department of Education, Edmonton, 1953.

Annual Report, 1954. Department of Education, Edmonton, 1955.

Annual Report, 1956. Department of Education, Edmonton, 1957.

Annual Report, 1957. Department of Education, Edmonton, 1958.

Annual Report, 1958. Department of Education, Edmonton, 1959.

Annual Report, 1960. Department of Education, Edmonton, 1961.

Annual Report, 1961. Department of Education, Edmonton, 1962.

Annual Report, 1962. Department of Education, Edmonton, 1963.

Annual Report, 1963. Department of Education, Edmonton, 1964.

Annual Report, 1964. Department of Education, Edmonton, 1965.

Annual Report, 1965. Department of Education, Edmonton, 1966.

Annual Report, 1967. Department of Education, Edmonton, 1968.

Annual Report, Regina, 1903. Department of Education, North-West Territories, 1903.

Brief to the Faculty of Education, University of Alberta. Submitted by the Industrial Arts Teachers of Alberta, December 31, 1944.
Prepared by N. J. Cameron and L. N. Elliott.

Conference of Alberta Composite High School Principals. Final report of the study concerning the vocational effectiveness of Auto 20, Auto 30 and Metal 20 and Metal 30 courses offered in 1954-55 and 1955-56 in seven Alberta composite high schools. Department of Education Archives, Edmonton, 1958.

Curriculum Guide for Alberta Secondary Schools, 1950. Department of Education, Edmonton, 1950.

- Handbook for Secondary Schools, 1927. Department of Education, Edmonton, 1927.
- Industrial Arts Laboratory Planning. Department of Education, Edmonton, 1968.
- Industrial Arts Newsletter, Vol. II, No. 2. Department of Education, Edmonton, December, 1964.
- Industrial Arts Newsletter, Vol. II, No. 3. Department of Education, Edmonton, March, 1965.
- Industrial Arts Newsletter, Vol. II, No. 4. Department of Education, Edmonton, June, 1965.
- Industrial Arts Newsletter, Vol. IV, No. 1. Department of Education, Edmonton, September, 1966.
- Industrial Arts Newsletter, Vol. IV, No. 3. Department of Education, Edmonton, March, 1967.
- Industrial Arts Newsletter, Vol. V, No. 3. Department of Education, Edmonton, March, 1968.
- Junior High School Curriculum Guide for Industrial Arts, 1964. Department of Education, Edmonton, September, 1964.
- Junior High School Curriculum Guide for Industrial Arts, 1969. Department of Education, Edmonton, 1969.
- Junior High School Handbook, 1962-1963. Department of Education, Edmonton, 1963.
- Programme of Studies for the High School, Bulletin I. Department of Education, Edmonton, 1940.
- Programme of Studies for the Intermediate School and Departmental Regulations Relating to the Grade IX Examinations. Department of Education, Edmonton, 1940.
- Programme of Studies for the High School For the Year Ending July 31, 1944. Department of Education, Edmonton.
- Regulations Relating to the Programme of Studies and Annual Examinations for the Year Ending June 30, 1937. Department of Education, Edmonton, 1936.
- Regulations Relating to the Program of Studies and Annual Examinations for the Year Ending June 30, 1939. Department of Education, Edmonton, 1938.

Report of the Royal Commission on Education in Alberta, 1959. Submitted by Hon. D. C. Cameron, Chairman. Edmonton: Queen's Printer, 1959.

Senior High School Handbook, 1952-53. Department of Education, Edmonton, 1952.

E. Yearbooks, Calendars, Papers

Harder, Jacob D. "A Rationale for Industrial Education." Edmonton, 1972.

Tech-Art Record 1927-28. Yearbook of Provincial Institute of Technology and Art, Calgary, 1928.

Tech-Art Record 1934-35. Yearbook of Provincial Institute of Technology and Art, V, Calgary, 1935.

Tingley, A. P. "A Concept of Industrial Arts and Its Significance in a Progressive Educational Program."

University of Alberta Calendar 1945-46. Edmonton, 1945.

University of Alberta Calendar 1946-47. Edmonton, 1946.

University of Alberta Calendar 1955-56. Edmonton, 1955.

University of Alberta Calendar 1963-64. Edmonton, 1963.

University of Alberta, Calgary Calendar 1963-64. Calgary, 1963.

University of Alberta, Calgary Calendar 1964-65. Calgary, 1964.

THE WINNIPEG SCHOOL DIVISION NO. 1

1577 Wall Street East, Winnipeg, Manitoba R3E 2S5

177

January 2, 1973.

Mr. John C. Smith,
Education Consultant,
Rm. 240 - 332 Sixth Ave. S.E.,
Calgary, Alberta. T2G 0G5.

Dear Mr. Smith:

Mr. R. J. Johns, the person you mentioned in your letter of December 22, 1972, died in Victoria, B.C. about a year ago. Before retirement he was the principal of the Technical Vocational High School in Winnipeg from November 1, 1948 to June 30, 1953.

Your reference in all probability is to the "general shop" idea which Mr. Johns favored as an environment which could better inter-relate the various trades and foster the transferability of hand skills as well as academic skills. The "family of occupations" concept on which the Technical Vocational School shops was organized clustered a number of related "unit shops" into one general area which more closely simulated industrial practice.

I am indebted to Mr. John Pankiw, Assistant Superintendent, Vocational, for this background information and I am enclosing a statement from Mr. Pankiw concerning the R.B. Russell Vocational School in Winnipeg which expands the "family of occupations" concept.

Yours truly,



H. Pollock,
Superintendent of Secondary Schools.

HP/er
Enc.
cc: J. Pankiw

DIVERSITY of VOCATIONAL OPPORTUNITIES

The R.B.Russell Vocational High School

The "family of occupations" concept, around which the R.B.Russell Vocational High School was built, recognizes the increasing need for a broad fundamental training in a group of kindred crafts and technical knowledges upon which any necessary specializations can be quickly built to cope with the constantly changing character of traditional trades and crafts.

It recognizes, further, the transferability of skills and the need for flexibility within the families and between the families.

Horizontal adaptability within the world of work can only be facilitated by breadth in vocational preparation. It is curtailed by "unit" programs designed to prepare students for specific operations.

Flexibility in facilities, diversification of learning opportunities and broad orientation are key considerations in planning for any education designed to give youth a running start in the world of work.

Because the success of the family plan depends to a large extent on TEAMWORK, a wide open shop fosters the merits of such a plan to the best advantage. Each shop houses a cluster of related crafts and is administered by a family head teamed with two or three assistants who are experienced in specific areas of the trade or craft. The team cooperates in lesson planning, sharing responsibilities, project coordination and evaluation. Improved communication and cooperation among teachers in each department fosters family cohesiveness, morale, and professional growth. Teaching resources are better adapted to groupings of students in ability levels.

Student LEARNING TEAMS, modelled after able teacher teams, are encouraged to contribute to the learning and teaching experience. In this environment, senior students are given opportunities to develop leadership and to practice the rudiments of foremanship, contributing to the organized group effort wherein juniors learn to work with fellow seniors.

FACSIMILATION of industrial production practices shop layout and management, is yet another characteristic which is unique in the family grouping of related crafts and which cannot be accomplished in a compartmented unit type of educational organization. In large factories, shops and offices of today's assembly-line economy, workers ply their crafts in wide-open areas which facilitate the flow of materials, projects and personnel.

Each FAMILY WORKSHOP is laid out with flexible space for several integrated areas and includes a distinctive classroom where related technology, such as mathematics, science, design and English peculiar to the family of crafts, is studied for practical application in the shop. Articulation between the areas adds meaning to interdependancy of skills being developed.

The Calgary Albertan, December 31, 1960

Need Better Courses

Public School System Should Be Reorganized

Robert Warren, superintendent of schools in Calgary said Thursday, he agrees with a great many of the recommendations of the Chant Royal Commission on British Columbia's school system.

He agreed particularly with the recommendation that the public schools system be re-organized. This, he said, is the most important part of the report, as far as Calgary is concerned.

The Royal Commission stated that provision should be made for ~~junior~~ and senior vocational schools, a collegiate academy and an institute of advanced technology.

Taking into account the fact that only about 10 to 15 per cent of students will attend university, and that 85 per cent will not, better courses should be devised so the majority can take vocational training," he said.

The Chant report also stated that top priority should be given to the three R's in the basic school curriculum. Warren said that in Alberta, emphasis has always been placed upon these subjects, despite the fact that many people have inferred they have been "thrown out of the window."

On teachers salary negotiations, which the commission says should be handled centrally through the B.C. Teacher Federation and the B.C. Trustees Association, instead of by individual school boards. Warren said "The Calgary School Board has always taken the stand that the question of what a community will pay teachers is a problem for the community to decide. This question was thrashed out and our recommendations stated in a brief to the Blackstock Commission."

He agreed wholeheartedly

with the additional loan plan to subsidize teacher - training to a maximum of \$4,000 providing for remission of \$1,000 a year to teachers willing to teach where assigned.

Warren added, "This will be a good way of getting a lot more people into teacher training. Teachers are in great de-

mand, and we need more every year."

The immediate discontinuance of elementary temporary teacher certificates and an increase in requirements for elementary basic certificates to three years training and early implementation of degree course requirements for teachers is urged.

The Calgary Herald, April 8, 1961

Board May Drop Shop From School Courses

Situation Under Study In Calgary

By LYNNE COVE

[Herald Staff Writer]

Shop courses in Calgary high schools may be doomed.

Harvey Bliss, chairman of the Calgary Public School Board, told The Herald Friday that the administration of the school system is making an intensive study of the courses to determine what should be done about vocational training in high schools.

He said the feeling is that the course should either be revised considerably by the department of education or dropped.

"As the curriculum is laid out now, the course is not being used for the purpose for which it was intended," Mr. Bliss said, "and it does not seem to lead anywhere."

"The students don't get any credit on the high school shop courses when they enter the Southern Alberta Institute of Technology and I don't think industry gives much recognition to them."

The report from the administration will likely be discussed by the school board within the next six weeks.

Ray Cannon, superintendent of separate schools, said, "we haven't looked into the situation yet, but the time is coming."

He referred to a statement made by Vernon Johnson, chairman of the Edmonton Public School Board, last week that shop courses are a waste of money.

VOCATIONAL SCHOOLS

"The thought is that the courses don't prepare boys for employment; it could better be done by letting the provincial government take over and provide vocational schools where boys would be given intensive training," Mr. Cannon said.

Mr. Bliss agreed with Mr. Johnson's remark that money being used for the present shop courses could be better spent.

He noted that at present about 75 per cent of high school students are taking the matriculation (university entrance) course. But statistics have proved that only about 20 per cent can handle the academic course.

CHANGES DISCUSSED

The board's education committee considered this factor when discussing what changes could be made if the accreditation system was instituted in Alberta, giving individual school boards more authority to deal with curriculum.

Mr. Bliss said that in that case the number of students entering the matriculation program could be controlled by setting a minimum standing based on results of Grade IX examinations.

That way students taking the matriculation course would, in general, have a higher standing and the administration could "beef up" the course.

SURPLUS PROBLEM

But the problem is, Mr. Bliss said, what to do with the other students.

"That was when we started to look closely at the present shop courses and the deeper we get into the matter the more we find the courses are not serving the purpose for which they were intended."

"We found that many of the students taking the courses

See Page 34—SHCP COURSE

From Page 21

Shop Course

were matriculation pupils," he said.

The way the curriculum is set up now, students taking shop courses still have to have matriculation subjects, Mr. Bliss explained. The academic end of the technical course is the same as that for matriculation students.

"That means that the technical course is very heavy for the students for which it was intended," he said.

Then comes the question of whether to build separate vocational training schools or to retain composite high schools.

"Theoretically, we are inclined to maintain composite high schools," Mr. Bliss said. "But the problem is how to fit in shop courses."

"We are very concerned about whether to continue building shops in the high schools which we will be building in the next two or three years."

Vocational education came into the spotlight this winter when the federal government examined the unemployment situation and decided that more vocational training would help alleviate the serious unemployment problem.

The department of education is pushing school boards to provide more vocational training, "but there has to be a considerable amount of change," Mr. Bliss said.

The Calgary Albertan, April 15, 1961

Money for Shop Courses

The disclosure of its chairman, Mr. Harvey Bliss, that the Calgary Public School Board is studying the advisability of modifying or discontinuing the "shop" courses now offered in high schools should occasion no surprise. Although the study was apparently initiated before the Hooke - Aalborg - Batchelor economy axe was wielded it has a definite bearing on the move to tighten the educational purse strings.

As Mr. Bliss says, the shop courses are not fitting students for employment in trades, although this, presumably, was one of their objectives. In addition, they are costly to provide, since it takes more money to build and equip an "industrial arts" room than it does to build and equip an ordinary classroom. Finally, the shop courses help to lower educational standards by constituting a temptation to students who should be studying mathematics or literature instead of learning how to make ash trays.

This latter difficulty might be readily overcome by prohibiting students following the matriculation program in the high schools from taking shop courses as "electives," at the same time raising the standards of achievement required of matriculants. This is a good answer as far as it goes, but it obviously doesn't go far enough. Mr. Bliss points out that the problem of what to do with the students who couldn't meet matriculation - course requirements would remain; and the schools would still be spending precious funds on shop courses of little value.

The logical answer is to revise these courses so that they are valuable — so that they lead either directly into employment upon graduation from high school or fit those who have taken them for post-high school vocational or technical training. Indeed, this is not only a logical answer but a just one, for youngsters who lack the qualifications for matriculation courses leading to university are nevertheless entitled to the opportunity to develop their abilities in other fields.

Unfortunately, it would probably cost a great deal more to provide practical vocational and technical courses at the high school level (and perhaps the junior high level as well) than it does to provide the existing shop courses. True, the money would be better spent. But where are the public school systems to get it now that educational economy is the watchword?

This, we suggest, is a question for the provincial government to answer — and also the federal government, since it is now showing interest in vocational training. The task of the public schools is to use the funds available to them to the best advantage of their students and the community. If the available funds won't stretch to cover both good academic courses and good vocational-technical courses the school boards should not be coerced into compromises offering nothing but false economy. They should either be given the money they need to do both jobs well or relieved of their non-academic responsibilities.

The Calgary Herald, October 13, 1961

School Plan Rushed To Get Federal Aid

March '63 Completion Is Target

Preliminary plans for two new high schools, which will save taxpayers at least \$1,000,000 if they are built before March 31, 1963, were approved by the Calgary Public School Board Thursday.

The schools will include vocational training wings which qualify for 90 per cent federal government grants if completed before March, 1963.

"The stakes in this are very high," said Robert Warren, superintendent of schools. "This is Calgary's first opportunity to get sizable assistance from the federal government. We've got to get this to the School Buildings Assistance Board as soon as we can."

The assistance board meets Tuesday in Edmonton.

One school, to be built at 40th Ave. and 4th St. N.W., to serve 800 vocational students and 400 academic students, is expected to cost about \$3,000,000.

The second high school, planned for the old Gun Club site at 16th Ave. and 35th St. S.W., will cost about \$2,500,000. It will accommodate 600 academic students and 600 vocational students.

J. Stevenson and Associates designed the north school. Rule, Wynn and Rule are architects for the southwest school.

Federal and provincial grants are expected to reduce the total cost of the two schools to Calgary taxpayers to about \$2,000,000.

DELAY COSTLY

But if construction should be delayed, the federal government grant for vocational training schools would be cut from 90 per cent to 50 per cent.

Equipment for vocational wings is expected to cost \$395,000 in the north Calgary school and \$305,000 for the southwest building.

The plans were approved by the board subject to some minor changes.

The vocational schools are intended to serve about 20 per cent of the high school population, Mr. Warren said. This will mean 1,400 to 1,600 students by 1963.

School board projections show that in three years the total high school population will have grown from about 6,600 to 9,500.

Mr. Warren said expansion of the city to the south and east could mean that more vocational training facilities will be required in the southeast area in the future.

"The biggest problem we've had," he said, "is that we have not had too much opportunity to plan the programs. So we have had to plan space requirements sufficient to allow some flexibility in the program."

Architects estimated that per-square-foot costs for the schools may be higher because of the tight time schedule and deadline.

The Calgary Herald, November 17, 1961

Vocational Schools Planned

EDMONTON (CP) — Alberta school districts have taken advantage of recently announced federal-provincial grants for vocational school construction to the tune of about \$21,000,000.

Dr. J. W. Chalmers, director of school administration with the department of education, said today nine school districts have submitted plans to the provincial government for some \$17,300,000 worth of vocational school construction.

Under the grants the school district pays 10 per cent of building and equipment costs. The provincial government puts up the remaining 90 per cent, 75 per cent of which is returned by the federal government.

The provincial government has also taken advantage of the grants with plans for a \$3,500,000 provincial technical school at Edmonton. The federal government will pay 75 per cent of the cost.

The biggest vocational school project is at Edmonton, where \$4,167,000 will be spent by the public and separate school boards.

The Calgary Public School Board will spend \$3,874,000 on two separate projects.

Other centres planning construction are: Jasper Place \$1,186,000; Red Deer \$1,365,000; Medicine Hat \$2,195,000; High Prairie, \$903,820; Lethbridge \$590,000; and Camrose, \$532,000.

Dr Chalmers said the figures were for buildings only and did not include an estimated \$2,500,000 cost of equipment for the 10 projects.

DEPARTMENTAL MEETING re VOCATIONAL EDUCATION
February 1, 1961

Present: Dr. W. H. Swift Mr. J. P. Mitchell
 Dr. T. C. Byrne Dr. H. T. Coutts
 Mr. M. L. Watts Mr. E. W. Wood
 Mr. A. B. Evenson Dr. R. E. Rees
 Mr. R. E. Byron Dr. H. S. Baker

Purpose: To prepare a statement for presentation to the meeting of city board members and their officials on February 10.

The conclusions reached are, of necessity, tentative. They should be regarded not as departmental or provincial policy but as possible avenues for the development of an adequate vocational education program locally.

1. The Provincial Institutes are becoming centres for the training of technologists for semi-professional occupations requiring knowledge to a greater degree than skill. The Institutes have a responsibility, as well, for the technical training associated with the apprenticeship programs, for the re-training of adults and for programs which cannot be offered in local systems.

As the Institutes move out of the field of pre-employment training for the trades, a need is created in vocational education at the high school level. The need is for adequate pre-employment training to be articulated with the apprenticeship program or directly with employment opportunities in industry.

There are many reasons why local school authorities should assume responsibilities in this field: educational programs should be geared to the needs of the community; liaison with local industry should be intimate and continuous.

The program provided by the local system in one or two selected high schools should be limited to certain basic areas. Training for a variety of occupations may be subsumed under each of the following headings:

- i. Woodworking
- ii. Machine shop, pipe fitting, welding, metalworking
- iii. Automotives
- iv. Electricity
- v. Radio and TV servicing (electronics)

2. In order to meet standards set by the Federal Government, to improve the quality of man power entering directly into industry, and to articulate effectively with the apprenticeship program, radical changes from present high school programs will have to be effected. The programs will have to be much more "trade" or "industrial" oriented and much less exploratory than is presently the case. These changes are indicated:

- (a) Much more time in the shop. The Grade X student should spend twenty periods a week in varied practical work, and during Grades XI and XII the same time allotment in practical work in one of the above areas. He should spend another five periods a week in shop theory. This implies a doubling of the time presently being spent in the shops. The school day for these students might be lengthened to six hours.
- (b) The staff should have at least journeyman qualifications and have had industrial experience. The emphasis in their training should be on the skill itself and on practical experience. The usual professional qualifications in education may be of secondary importance.
- (c) There should be a close liaison with local industry with respect to both placement and program.
- (d) The equipment in most instances would not differ in kind from that presently in use in well-equipped composite high schools. Much more equipment would be required, however, as well as more accommodation.
- (e) The student in this program should take related courses in mathematics, science, and English. While these may be taught by academic teachers, the content should be related to trade training.

- 3. Consideration should be given to the articulation of this program with those of the Institutes of Technology. Superior students from these centres should be encouraged to go on to the Institutes, and the two Institutes should establish close liaison with these local centres. They might actually accredit these schools for certain courses. The fields of electricity and drafting might prove fruitful for articulated planning.
- 4. The nature of the Federal agreement should be presented to the meeting. The availability of Federal funds, effected through an amendment to provincial grants regulations, might serve as an incentive for immediate local action towards the extension of programs in certain composite schools.
- 5. The service occupations might be explored. The Home Economics departments might consider short courses for waitresses and cooks.
- 6. The charts developed by Mr. Byron will reveal the relationship of the proposed program to other high school programs now in effect.

T. C. Byrne
Chief Superintendent of Schools

Dr. W. H. Swift
Deputy Minister of Education

August 17, 1961

The need for the establishment of a Technical-Vocational Committee of the Senior High School has been discussed and placed before the Minister. My understanding is that tentative approval has been given to the establishment of this Committee.

To review: The Technical-Vocational Committee will have on it representatives from the Senior High School Curriculum Committee and will report to the Senior High School Curriculum Committee on matters related to programs of study. Further, this Committee will have representatives on it and will report to the proposed Provincial Advisory Committee on Technical Training. The major function of the Committee will be to co-ordinate the planning and organization of technical-vocational education in provincial high schools. Presumably a great deal of planning will be done locally in such districts as Edmonton and Calgary.

The following is a proposed list of members which was developed at a meeting of the staff of the Instructional Division and in consultation with some of the officials in the Edmonton system:

Mr. R. E. Cunningham (Chairman)
Mr. R. E. Byron
Mr. J. P. White (or some other representative from the Apprenticeship Board)
Mr. E. W. Wood (Southern Alberta Institute of Technology)
Mr. J. P. Mitchell (Northern Alberta Institute of Technology)
Mr. O. Massing
Mr. A. B. Evenson (representing the City of Edmonton)
Mr. W. E. Robinson (Supervisor of Industrial Arts, Edmonton system)
Mr. T. M. Parry (Supervisor of Vocational Education, Calgary)
Mr. R. Warren (or his representative) (representing city of Calgary)
The Chief Superintendent of Schools and the Director of Curriculum will be ex officio members of this committee.

We think it is now time to have this Committee established and the consideration of the Minister is respectfully requested.

Chief Superintendent of Schools

November 14, 1962

The Board of Teacher Education and Certification met on Wednesday, November 14th, 1962 at 9:30 a.m. in the Library of the Department of Education, Administration Building. Present were Messrs. T.C. Byrne (Chairman), P. Chauvet, S.C.T. Clarke, H.T. Coutts, R.H. Cunningham, E.M. Erickson, R.E. Folinsbee, J.W. Gillis, R.E. Rees, T.F. Rieger, M.T. Sillito, D.E. Smith, T.C. Weidenhamer, and M.L. Watts.

The minutes were recorded by J.I. Sheppy.

- (a) In the absence of H.C. McCall, Mr. M. Sillito was admitted to the privileges of membership.
- (b) Dr. Baker missed the meeting because of transportation difficulties.
- (c) Mr. T.C. Weidenhamer replaced Mrs. C.B. Andrews.

Item 1
Minutes of
August 29, 1962

Motion: Messrs. Folinsbee - Cunningham; that the minutes be adopted as circulated.

Carried.

Item 2
Certification
of Teachers in
Private Schools

Brief reference was made to the Minister's approval of the B.T.E.C. resolution (Item 5 (2) B.T.E.C. minutes of June 11, 1962) recommending that private schools come under the same regulations as public schools with respect to the certification of teachers for elementary and Junior High school grades.

The chairman also briefly reviewed the status of the teacher training courses offered at Canadian Union College.

Item 3
Alberta's
School
System
("Primer")

- (1) Some disappointment was expressed over the fate of "Alberta's School System" since the careful preparation and editing of the document had involved many man-hours of work. Two thoughts emerged from the discussion:
 - (a) That the Home and School might have passed a letter of appreciation to those concerned in the preparation of the document.
 - (b) That a limited distribution of mimeographed copies might be made to test the usefulness of the document.
- (2) Motion: Messrs. Rees - Clarke; that one thousand copies of "Alberta's School System" be mimeographed for the purpose of examining and testing the usefulness of the document.

Carried unanimously.

- (3) It was further suggested that the Registrar, Department of Education might adapt the material for regular distribution to applicant teachers from abroad.

Suggestions for possible distribution of the document, if mimeographed, were as follows:

- (a) 100 copies to the A.T.A.
- (b) Copies to the Alberta School Superintendents and School Boards.
- (c) Copies to Alberta House, London.

Item 4
Internship

- (1) Mr. Sillito briefly reviewed the recommendations of the Internship Committee, all of which had previously been confirmed by resolutions of the Board (Item 8 (2) (3) (4) B.T.E.C. minutes of June 11, 1962.) The place of internship in the teacher education program was described as follows:
- (i) The program fits in between the institutional course and the actual practise of the vocation of teaching.
 - (ii) It is analogous to practise teaching since the internee is not in complete charge of the classroom.
 - (iii) Internship serves to close the gap between the theoretical and practical aspects of teaching.
 - (iv) It is a co-operative venture involving the Faculty of Education, the Department of Education, the Alberta Teachers' Association, the School Boards and Alberta School Trustees Association, and Superintendents and Administrators.

It was noted that the appointment of Mr. C.G. Merkley to head up the program was the Department's response to Item 8 (4) of the B.T.E.C. minutes of June 11 which had asked for the Department of Education to supply leadership for the program. Both the A.T.A. and A.S.T.A. urged financial support for the internship program through the Foundation Grants.

- (2) Motion: Messrs. Clarke - Weidenhamer;
WHEREAS the Minister is giving careful consideration to the Board's resolutions dealing with the proposed internship program, and

WHEREAS preliminary steps to implement the program have been taken by the Department under Item 8 (4) of the June 11th minutes (the Board expresses its appreciation for this move),

THEREFORE, this Board urges the Minister to give early consideration to Internship in the Foundation Program plan.

Carried unanimously.

Item 5
Industrial
Arts &
Vocational
Education

- (1) Dean Coutts reported as follows:
- (i) There are 83 presently enrolled in the Vocational Education program.
 - (ii) Eleven of the 83 are from Saskatchewan.
 - (iii) The average age is 40.
 - (iv) All have senior matriculation and eleven hold B.Sc. degrees.
 - (v) All have journeyman or equivalent status.
 - (vi) About fifty hold bursaries.

- (vii) It is estimated that the Faculty will have to produce about 40 teachers annually.
- (viii) Alberta may become the Western Centre for training vocational teachers.

Because the Northern Alberta Institute of Technology is not yet able to accommodate student teachers, the unit shops in Edmonton and Jasper Place are being utilized for observation and practise teaching. An Edmonton hairdressing school is providing an opportunity for practise teaching for hair stylists and those interested in beauty culture are working out a program in consultation with the co-operating home economics teachers.

- (2) Dr. Coutts then pointed out the differences between Vocational education and Industrial Arts, the former being preparation for technical competence while the latter, a facet of general education, gives broad laboratory experiences designed to instill an appreciation of the world of technology. It was also noted that the present Industrial Arts program in Alberta had never realized the goals envisaged by the Department of Education, partly because of inadequate equipment in the schools and partly because of the restricted nature of the teachers' laboratory experiences. Dr. Coutts was anxious to experiment with a broadly based Industrial Arts program to be taken on the Edmonton campus without interfering with the Calgary program.

Motion: Messrs. Clarke - Cunningham; that the Board approve in principle the institution of a B.Ed. program in Industrial Arts.

Further note leading to the (Amended May 15/63) Carried.

Item 6
Graduate
Diplomas in
Specialization

Dean Coutts presented a proposal, approved by Faculty Council, whereby graduate students might earn diplomas in designated fields by completing four approved graduate or senior courses under the Faculty of Education.

Motion: Messrs. Coutts - Rees; that the Board approve in principle the issuing of diplomas in a variety of specializations.

Carried.

Item 7
Graduate
Program in
Education

Dean Coutts referred to the problems presented by graduates who enter the twelve-course B.Ed. program lacking one or both of the pre-requisites for Ed. 476 and Ed. 492. The proposal was that the Standard S certificate be issued to those completing six courses, including one or both of the pre-requisites; that the Professional certificate be issued when both sequent courses have been completed. The balance of the program would be five or four courses, to make a total of twelve. Dean Smith suggested that the total program should exceed twelve courses when pre-requisites have to be made up.

Motion: Messrs. Clarke - Gilles; that the Board approve the certification procedure, as outlined, for holders of approved degrees who lack certain pre-requisites.

Carried.

Item 8
Revision of
B.Ed. programs

Dean Coutts distributed copies of the revised elementary and secondary B.Ed. programs and commented on them. The secondary program retains its Arts and Science to Education ratio of eleven to nine while the elementary program may have corresponding ratios of ten to eleven or nine to twelve. Both

MINUTES OF A MEETING TO DISCUSS INDUSTRIAL ARTS PROGRAMS
IN THE FACULTY OF EDUCATION, UNIVERSITY OF ALBERTA

A meeting was called by the Deans of the Faculty of Education, University of Alberta, Calgary and Edmonton, to discuss problems related to programs in industrial and vocational education. The meeting was held in Room 108, Education Building on Thursday, April 11, 1963, from 9:30 to 4:30 p.m.

The following were present:

From the Department of Education: Dr. T. C. Byrne, Chief Superintendent of Schools, Mr. J. P. Mitchell, Director of Vocational Education, Mr. M. L. Watts, Director of Curriculum, Mr. R. H. Cunningham, Supervisor of Industrial Arts, Mr. M. McDougall, Acting Supervisor of Industrial Arts, Calgary;

From the Alberta Teachers' Association: Dr. S.C.T. Clarke, Executive Secretary, Mr. George Sutherland, President Specialist Council in Industrial Arts, Mr. Scotty Day, Secretary Specialist Council in Industrial Arts;

From the Apprenticeship Board, Department of Labor, Mr. F. E. Whittle;

From the Northern Alberta Institute of Technology, Mr. W.A.B. Saunders;

From the Southern Alberta Institute of Technology, Mr. Fred Jorgensen;

From the Faculty of Education, Calgary, Dean H. S. Baker, Dr. T. G. Finn, Dr. S. A. Lindstedt; Edmonton, Dr. H. R. Ziel, Dr. L. W. Downey, Mr. J. Gallagher, Dean H. T. Coutts (Chairman).

Dr. COUTTS outlined briefly the present programs in industrial arts:

- (1) the regular program which is followed by students coming from high school and which gives general preparation in the various components of industrial arts;
- (2) Route 1 which follows the general program except in the third year when specialization is taken in one unit shop;
- (3) Route 2 which gives one year of advance credit to the holders of an Alberta journeyman's certificate and which is followed by three years of largely academic and professional studies;
- (4) Route 3 consisting of a

- 2 -

two-year program at one of the Institutes of Technology followed by three years of academic and professional studies as for Route 2.

These programs have been in operation for some time in Calgary, with rather limited registration in Route 3. Now with the advent of vocational education, we are faced with new problems. This session there are 84 candidates registered in the B.Ed. in Vocational Education program. Some 12 of these are holders of an approved degree, the others have clear matriculation, journeyman's certificates or equivalent, and in many cases advanced standing because of university courses taken here or elsewhere. The present first-year registration in the B.Ed. in Industrial Arts is 27, second year 13, third year 13, fourth year 4. With the new emphasis on vocational education programs throughout the province it becomes necessary to take a look at the industrial arts courses presently being given in the secondary schools. There are smaller centres throughout the province where the present type of industrial arts options will continue to be given although it is anticipated that in larger centres where there are vocational schools the demand for these options will decrease. Mr. CUNNINGHAM indicated that at present there are 20,000 students taking shop courses in the junior high schools and about 10,000 in the senior high schools.

Dr. COUTTS drew attention to the new Route 4 program in Industrial Arts which had been approved in "principle" by the Board of Teacher Education and Certification and in detail by the General Faculty Council of the University.

Alternative Industrial Arts Teacher Education Program
Faculty of Education, Edmonton

DIVISION OF INDUSTRIAL AND VOCATIONAL EDUCATION

If one maintains that general education should lend understanding to those aspects of the environment which children and youth do not come to understand as a result of participation in other institutions, e.g. the family, he must maintain that a significant portion of the educational program should be devoted to the development of an understanding of contemporary business, industry and technology because there are such important forces in society. The ever-increasing importance of technology, whether it be evident in the missile site, the manufacturing plant, the banking firm or the supermarket, demands that youth must be aware of technological demands. The industrial arts teacher has the task of interpreting the productive aspects of our environment to students by giving meaning to the many forces in the dynamic world of work. If industry and commerce are vital in our society, youth will benefit immeasurably from an industrial arts program that provides learning experiences that: (1) are representative of tasks in these institutions, (2) are indicative of the kinds of knowledge used in the business enterprise, and (3) are examples of the importance of, and the interrelationships which exist between, the pure and applied arts and sciences in the world of work.

To provide understanding of the world of work is a large undertaking. When one begins selecting content to facilitate the understanding he must look for factors which are inherent in all productive organizations. One finds that, regardless of the role of the institution whether it relate to raw material, product, or service, there are some inherent common denominators:

- (1) Tools, machines, and materials play an important role in all productive organization;
- (2) Certain technological processes are inherent in all kinds of organizations, e.g. communication, power and power transmission, electricity-electronics;
- (3) All business enterprises have an authority configuration that is imposed by the formal as well as the informal organization;
- (4) All organizations create pressures which have profound influences upon the effectiveness of employees and upon the entire population;
- (5) All organizations involve some degree of specialization and are faced with the problem of integrating specialized skills and knowledges into a productive system.

The Department recommends that an industrial arts program to interpret such a dynamic environment should be developed in four stages. The first stage (grade seven and/or eight) should be devoted to a general interpretation of the significance and interdependence of tools, machines, and materials. The second stage (grade eight and/or nine) should introduce a representative sampling of current technological processes. The third stage (grade ten) should simulate conditions that interpret the many forces which are responsive to the demands of a technological process and the influence of these forces upon the finished product and the employee as he functions in the organization. In the fourth stage (grades eleven and twelve), the student, after having acquired an appreciation of tools, machines, materials, technological processes, and their impact upon the many forces inherent in an organization, should concentrate on

acquiring a greater knowledge of the current technology of his choice. This stage emphasizes theories and principles. This should be done through "bread-board" and prototype activities. The interdependence of technologies and the need for teamwork should be stressed.

The following is a proposed program for preparing teachers who would communicate the above kinds of knowledge to children and youth. Each newly proposed course is described.

1st Year

- I.A. 213/Ed.Adm.261 Philosophy, Principles and History. (3-0;3-0)
 An examination of past and present theory and practice in industrial arts education.
- Ed. Psy. 276 (3-0;3-0)
 English 210 (3-0;3-0)
 Math. 200 or 201 (3-0;3-0)
 Ed. I.A. 260 General Industrial Arts (3-6;3-6)
 The development of basic knowledge and skills in the use of electricity, plastics, ceramics, wood, metals and graphic arts; the ability to organize and teach multiple activity laboratories in the junior high school.
 Note: (This course is designed to prepared industrial arts majors for teaching in grades seven and/or eight.)
- Phy. Ed. 218 or 228 (0-3;0-3)

2nd Year

- Chemistry 230 (3-1S-3;3-1S-3)
 Ed. C.I. 300
 Physics 240 (3-3;3-3)
 Sociology 202 (3-0;3-0)
 Ed. I.A. 270 Introduction to Technology (3-6;3-6)
 Development of Industrial Arts teaching competence in the following technological areas: electricity-electronics, computer, mechanical, power, graphic communications, and materials and processes; organizing and managing laboratories which involve these activities.
 Note: (This course will prepare industrial arts majors for teaching in grades eight and/or nine.)

3rd Year

- Ed. Psy. 476 (3-0;3-0)
 Chemistry 350 (3-3;3-3)
 Physics (electricity & magnetism) 380 (3-3;3-3)
 Ed. I.A. 370 Technology I (2-4;2-4)
 A course designed to prepare the industrial arts majors by developing additional subject matter competence in the areas of electricity-electronics and computer technology.
- Ed. I.A. 360 Laboratory of Technology (2-4;2-4)
 Laboratory experiences to acquaint industrial arts majors with: interrelationships of technologies and influence of organization and workers upon quality and cost of product.

- 5 -

4th Year

Ed. Fdn. 492	(3-0;3-0)
Sociology 390	(3-0;3-0)
Ed. I.A. 350 Educational Programs and Practices in Industry and Labor	(3-0;3-0)
Scope, organization, practice and evaluation, of educational programs conducted by management and labor.	
Ed. I.A. 460 Technology II	(2-4;2-4)
A course designed to prepare the industrial arts major by developing additional subject matter competence in the areas of materials and processes and power.	
Ed. I.A. 470 Technology III	
A course designed to prepare the industrial arts major by developing additional subject matter competence in the areas of mechanical technology and graphic communications.	

This program has a different emphasis and requires the setting up of laboratories for the preparation of students. It is hoped that this program will be introduced in the fall of 1963. Before admitting students to it, however, the Faculty feels it advisable to have general consensus that this is a desirable program and some advice as to the future course of industrial arts programs generally.

Exploration of the place of industrial arts and vocational education in the schools of Alberta in the years ahead

Mr. MITCHELL asked how many students were registered in industrial arts at present.

Dr. FINN replied that because of the limitations for shop purposes it was necessary to set a quota of 20. There are 18 taking first year shop courses at present in Calgary.

Dr. Finn felt that Route 1 with its requirement that 15 months must be spent in industrial experience could be done away with.

Mr. CUNNINGHAM felt that industry should encourage people to taken an industrial arts program. Several excellent men in industry serve on the vocational committee and these men realize that industry has an obligation and responsibility that they have not fulfilled. The feeling is that the weakness of Route 1 is that the people on it have not qualified for a journeyman's certificate in the regular way.

Dr. CLARKE wondered how many industrial arts teachers are needed.

Mr. CUNNINGHAM estimated that with the present rate of increase, 300 would be required

- 6 -

in the next decade. This means approximately 25 new candidates each year. In order to meet the requirements we have been drawing heavily on the United States, Saskatchewan, and Manitoba.

Dr. DOWNEY asked if the needs of the high school will not now decrease.

Mr. MITCHELL replied that it was difficult to forecast accurately what might happen but the feeling is that industrial arts will operate at the same scale in grades VII, VIII and IX, and possibly in Grade X, but that in Grades XI and XII the numbers will drop off as student transfer to the vocational type of high school.

Mr. CUNNINGHAM agreed with this assessment.

Dr. BAKER wondered if the situation in the junior high school might not change.

If it is the general policy not to offer industrial arts in Grade VII then fewer teachers would be required. The Department might change its policy in this regard.

Mr. CUNNINGHAM replied that this matter of not offering shop courses in Grade VII is purely a matter of local policy. Although it is done because of lack of space in the shops in Calgary and Edmonton, it is not an established policy of the Department.

Mr. McDOUGALL mentioned that students who want to take a French option in the junior high school do not have time to take a shop course. Mr. Robinson, who is in charge of industrial arts education in Edmonton, has reported great difficulty in getting industrial arts teachers because so many are going into vocational high schools.

Mr. WATTS wondered if instead of having a three year industrial arts program it might not be better to have a stronger two year program.

Dr. BAKER wondered if the Department of Education had any definite views on this--at the moment it appeared that the Department is waiting to see how we proceed.

Dr. BYRNE supposed the Department might look at the content of industrial arts and if it became so attractive that everyone wanted it for three years then we might have to make it available and increase the number of classes. At present we have not had a recent look at the content of industrial arts in the junior high schools.

- 7 -

Mr. CUNNINGHAM felt that the Department is so involved in the vocational programs that it has not been able to give enough thought to the present status of industrial arts. It has not had time to re-examine the programs.

Dr. COUTTS assured the meeting that we were not being critical of programs--we were only seeking guidance. If the Faculty waits until the effects of the vocational education program are assessable, then it is too late to begin a program of preparing teachers in a different way for industrial arts programs based on changed concepts.

Dr. CLARKE pointed out that Mr. Ward Steckle claims that he persuaded his people to have five credit shop periods. The up-shot of this, in contrast to the regular 15 credit periods, is that they got a large percentage of people in the matriculation program who were able to take this as an option. If this continues perhaps then we would need a good many more industrial arts teachers in the high school.

Mr. MITCHELL thought that we would have to say these 10-15 credit courses are really vocational courses and we will always have them.

Dr. COUTTS would have grave reservations about the preparation given in some shop courses in Grades XI and XII.

Mr. SAUNDERS felt that the program is there but there are too few teachers with the proper background to give it effectively.

Mr. CUNNINGHAM mentioned that the program for vocational high schools at the Grade X level is not quite definite as yet. The High School Curriculum Committee have also given approval for school boards to give Grade X and XI courses with 20 credits. This was done in order to accommodate students who would follow an academic program in a small centre. At the end of Grade X they might go into a vocational program from an academic one. This would permit them to combine the 5 and 15 credit program in Grade XI. It would be recommended that they be taken in Grade XI. A number of schools have indicated a fair amount of interest in this program, e.g. the smaller high school in the smaller town. We hope to fill the vocational high schools if the Grade X program has flexibility. If the trend, and we won't know until later, is to a two-year program,

- 8 -

then we need a good industrial arts program in Grade X. This could be done in the junior high school by permitting a student to circulate through the five general shops. This would give the students experience to make an intelligent decision about the area in which he might wish to work.

Dr. BYRNE pointed out the fact that the action of certain people took us into the vocational education program without warning and we are not quite sure what the implications are for our industrial arts program. If anything seems to be developing it is this: that industrial arts will seem to end at Grade X and the Grade X program will tend to reflect what has gone on in Grades VII-IX. There is a feeling that vocational courses will be limited to vocational schools. There will not likely be an emphasis on any specific vocational training until Grade XI. We must then have people who are rather versatile in their approach.

Mr. CUNNINGHAM felt there is a definite place for the Grade XI and XII shop courses. He mentioned drafting as an example. Students going on to university find it much easier if they have taken Drafting 10 and 20 before embarking on this course in university.

Dr. ZIEL pointed out that the courses offered in vocational high schools must not be static. They will have to be flexible to meet the needs of the times. In the junior high schools the students should be given a program that is craft oriented with technological overtones related to academic disciplines. We must try to anticipate what is needed in 1967-69.

Mr. WHITTLE recalled that some years ago he taught in Grades VII, VIII and IX. At that time he felt he was having a modest success but he now realized that he passed up an opportunity of introducing items of general education in mathematics and science that had an implication in industrial arts and would have been most useful to the student. He felt that if industrial arts is going to do a worthwhile job, it will have to provide more general education. There are bound to be people who cannot grasp technical and general education from textbooks.

Dr. CLARKE felt we must consider the large number of high schools in the province with about 400 students, e.g. Barrhead, Westlock, Wetaskiwin. Here students are not in centres where vocational high schools are operating and it is with these students in mind that he questioned whether it would be right and proper if industrial arts in the high school should cease altogether in this type of school.

Mr. WATTS assured him that there will be programs at the Grade X, XI, XII level.

Mr. MITCHELL felt that courses with five credits in the various fields will be about all that can be reasonably offered.

Mr. McDOUGALL pointed out that places like Innisfail and Wetaskiwin have new schools. They want their students to have a broad type of program. They will taken general courses in various areas.

Dr. FINN felt that with the exception of Mr. Cunningham the general feeling is that with the advent of vocational education the unit shop program would come to an end. He felt, though, that there are some students who are interested in taking shop as a change from the regular academic courses. He felt that in vocational education they are aiming at the bottom 25% of students whereas in the academic group there are 75% who are interested in doing something in this line. He felt there would be an increased interest in vocational education and this would in turn give an increased interest in the unit shop.

Mr. WATTS pointed out that the high school cannot attempt to do everything. There is an opportunity for people to attend night classes for skill courses.

Mr. MITCHELL wondered if in Calgary they will offer a three-year industrial arts program in the high school.

Dr. COUTTS took the view that there should be in the high school program, on some kind of optional basis for the student who is going to take a general type of education a chance to deal with ideas about the world of work. He felt they should know something about what goes on in the field of technologies--to do some work on an experimental basis.

- 10 -

Dr. ZIEL felt this was entirely possible. The good industrial arts teacher, preferably with a technologist background, would do this as long as he had a knowledge of the medium that he would be using.

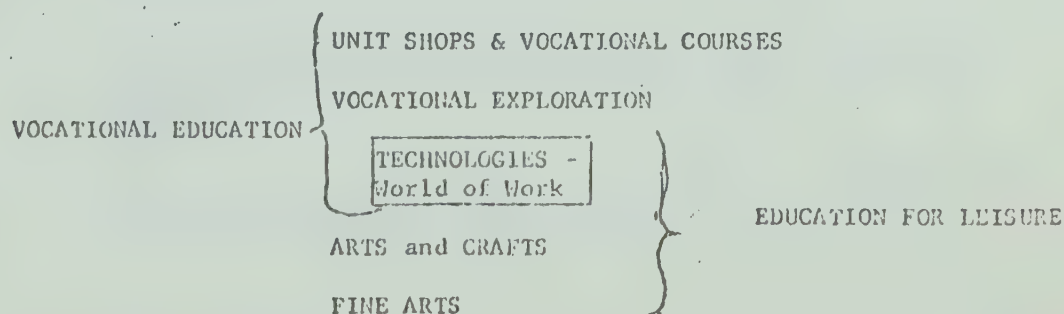
Dr. CLARKE had heard high school pupils say that with the re-introduction of French 10-20-30 and Biology 20-30 there are no spots for options. There is a tremendous impetus in the United States for summer sessions with enriched courses and courses in industrial arts and vocational education. These are sometimes held in the hours before or after school or on Saturday morning.

Dr. BYRNE felt that the present shop courses had little practical value. We have agreed there are a number of students who will take a broad program. He doubted that we will be able to continue to make courses in separate areas like woodworking, electricity, etc. available, but rather that we must give more general courses. This means that the teachers must be able to give a general course and also to give a five credit course in these shop areas.

Mr. CUNNINGHAM felt that when he had himself followed the unit shop program, it would have been advisable to have had a general shop training as well.

The meeting adjourned until 2:00 p.m.

Dr. BAKER presented the following chart as an outline of the relationship between these various areas.



Dr. BAKER wondered if the school should undertake to provide this range of activities and also if we could get teachers with the range of competence to give the courses.

- 11 -

Mr. CUNNINGHAM felt this represented really two needs, one for actual teaching-learning in the schools, and the other for leisure-time activities in after-school hours.

Dr. ZIEL felt that the technologies and crafts associated with vocational and industrial arts have a different connotation than Arts and Crafts and Fine Arts.

Dr. COUTTS outlined in basic terms a modest proposal which seemed to agree generally with the lines of the discussion. It was based on the following assumptions:

1. That the general education-multiple technologies approach to industrial arts has considerable promise but especially at the junior high school level.
2. That the vocational education program being offered in vocational high schools of the province will tend, in those centres where it is offered, to replace the industrial arts program in Grades X, XI, and XII and especially the unit shop offerings in industrial arts.
3. That the unit shop program in industrial arts will tend to continue in smaller centres where there are no vocational schools and this program may serve both a general education and a quasi-vocational purpose.
4. That the industrial technologies approach to industrial arts may well become a future general education offering in Grades X, XI and XII.

With this in mind and recognizing the costliness of teacher education programs in these fields, it is proposed rather humbly and tentatively that:

1. All of the needs of the schools in relation to industrial arts and vocational education may be served through slight modification and revision of present programs.
2. The teacher education programs for industrial arts and vocational education be brought together under one Department of Industrial and Vocational Education and that this Department and the programs it offers be centred in one place, probably Edmonton.
3. Industrial technologies laboratories at a cost of approximately \$60,000 for equipment be set up either in the new Education Building, Edmonton, or in the Northern Alberta Institute of Technology.
4. The route to be outlined by Dr. Ziel would meet adequately all of the needs which we foresee both present and future.

Dr. ZIEL submitted programs which would apply to students taking industrial arts routes or vocational education routes. He proposed a slightly different program for students who enter the Faculty from the vocational high schools than for those coming with a strictly academic background. There is also a variation in the program for those who hold 35 vocational education credits or two years of technical credit. At the end of two years each student taking the B.Ed. in Industrial Arts would be qualified to teach in a junior high school industrial arts laboratory. Dr. Ziel felt that further specialization was necessary for students preparing to teach in the unit shops in the high school. They should complete the third and preferably the fourth year of the B. Ed. in Industrial Arts program before teaching in these unit shops. Those taking the B.Ed. in Vocational Education would take a different course since they must hold journeyman's qualifications or equivalent before entering this program.

Dr. FINN questioned whether this program would give sufficient concentration in the unit shop areas to fit students to teach in unit shops.

Dr. CLARKE pointed out that with the requirement of two years of teacher education before certification it is necessary to have teachers doing their student teaching with this much education and this is no difference in an industrial arts pattern than in an academic pattern.

Mr. SUTHERLAND felt that students coming from a unit shop or vocational program are going to be better equipped than those coming from a strictly academic school.

Dr. ZIEL agreed with him and pointed out that this is why he has Ed. I.A. 270 and Ed. Voc. 280 to serve both types of students.

Dr. BYRNE asked how effectively could a person at the present time move into a unit shop and teach our present curriculum. He was told that the Curriculum Guides are not always followed in detail.

Dr. ZIEL said there are seven major technological areas: electronics, wood, data processing, auto mechanics, power, graphic arts, material processing.

- 14 -

Mr. MITCHELL would be in favor of the general type of program outlined but wondered if the present shops could meet it with their equipment.

Dr. ZIEL felt that it would not be too difficult to introduce new ideas in the existing shops.

Dr. BYRNE could see the value of having one route in technically oriented areas and the other in the craft area as is presently being given.

Dr. FINN felt there was a great difference in the hours spent in the shops but it was pointed out that students taking this program would come with 35 credits from vocational courses taken in the high schools. They would serve an apprenticeship for some time as well. These men could not receive a Journeyman's Certificate without serving an apprenticeship. They would not be useful in a vocational set-up but would be useful in an industrial arts area.

Dr. COUTTS felt that those who came from vocational schools with 35 credits and then took their apprenticeship and qualified for a journeyman's certificate would have a very worthwhile background.

Dr. FINN felt that students taking the "A" program could only teach in a cluster shop--not in a unit shop, but Dr. Ziel felt they could teach in the shops as they are now in the junior high schools, and this at the end of their second year of the program. The third and fourth years of the program determine whether they take training in special unit shop areas--either in the technologies fields or in the trade or craft areas.

Mr. WATTS was impressed with the flexibility of the program but he wondered if people with lower I.Q.'s would be able to cope with this new concept. At present the students work with their hands more than with ideas.

Dr. ZIEL pointed out that this was the basis of this type of program--to help the child determine through special cluster-type activities what particular field best fits his interests and abilities.

Mr. SUTHERLAND pointed out that we do have a terminal program for these people now.

Dr. BYRNE felt that the people, at the end of the second year, will not be quite as well prepared to do the type of thing they do now but at the end of four years they will

- 15 -

have a breadth of knowledge plus a specialty in the last two years. Even if we don't change the curriculum these people are still capable of fitting in to the present programs.

Mr. WHITTLE felt that this new concept will offer a chance for the students to get in touch with the world around them.

Mr. SUTHERLAND said his group approved heartily the concept presented here. Even our present program would be improved with what is suggested. *Now the question is whether the Faculty Council members will approve it.*

Dr. COUTTS felt that this discussion has indicated that the program outlined

by Dr. Ziel would be acceptable to the groups represented. The program for preparing

✓ industrial arts teachers has been approved by the General Faculty Council of the

University. The next concern is whether only one type of program should be offered or whether one should be given in Calgary as at present and another in Edmonton.

It was felt that the programs proposed would eliminate the need for a quota system in the shops in the Institute of Technology. It was agreed that the present program should be continued to serve those already taking the present B.Ed. in Industrial Arts program.

IT WAS AGREED that before any definite plans were formed regarding the "B" type program for vocational education students coming in with the special vocational high school background that Mr. Whittle and the Apprenticeship Board should confer with the Faculty of Education to formulate more definite plans. It would be necessary for the Apprenticeship Board to look into this proposed program more fully before coming to any decision.

Dr. BAKER wondered about the line of demarcation in some of these areas particularly in the handicraft type. Presumably in an art class students will be working with the graphic arts. There might be some overlapping in ceramics.

Dr. ZIEL felt this would present no problem--in an art class the student would be more interested in the form of the article but in the vocational or industrial arts class

he would deal with such things as the chemicals going to make up the glaze. This

works in the graphic art field too-the graphic artist is not necessarily skilled in the technical side of the graphics area.

Dr. COUTTS pointed out that we have a responsibility to those presently embarked on a teacher education program. The new students coming in in the fall need to be taken care of. He wondered where this training would be given? In both places, Edmonton and Calgary or in Edmonton or in Calgary?

Mr. CUNNINGHAM noted that a new type of shop has been set up in Jasper Place. He wondered if before making any change we should not see how this worked out.

It was pointed out that we cannot wait because teachers must be ready to meet the needs of the schools. ? *What does this mean?*

Dr. BYRNE felt that we must assume that the teacher can go into our present shops and operate within our present program. Otherwise it would not be possible to consider this new concept.

Dr. BAKER pointed out that the members of the Faculty had met in Calgary and at that time had stressed the fact that the Faculty in Calgary was not "empire building". They do have an amount in the current budget for an industrial arts appointment. He wondered though if it would not be possible for the University to make the decision as to Edmonton or Calgary giving these programs. In so far as the old program is concerned it will be continued in order to serve the students presently embarked on it.

Dr. COUTTS noted that we might double the number of industrial arts candidates if we opened two centres. How many he wondered would take an industrial arts program if it was given in Edmonton but who would not go to Calgary? We might then justify the first two years in both places if we were not tying up too much space in the Institutes.

Dr. BYRNE felt that we owe a great deal to Calgary but for the long range plans of the province it seemed to him that we are not big enough to operate two centres. Since they are so clearly related, vocational and industrial arts, it seems impossible to offer one without the other. He felt it was not necessary to operate in two separate places. He thought it should be concentrated in one spot. The vocational centre is now located here and it seemed to him that the industrial arts centre should come along to it.

- 17 -

Dr. ZIEL felt that while some people might be attracted to one centre or another you might re-organize your program so that you could utilize both Institutes at some point in the program.

Dr. FINN pointed out that the N.A.I.T. was built to relieve the pressure upon the S.A.I.T. Just at this time it looks as if the S.A.I.T. might have some easing with respect to space and staff.

Mr. JORGENSEN thought there might be fewer students.

Mr. CUNNINGHAM wondered how many industrial arts students Dr. Ziel could handle here.

Dr. ZIEL felt 20 in each lab.; possible 40-50 people in total in the first year.

Dr. COUTTS wondered if it would be advisable to offer the first two years of the program in two centres and the final two years at one centre.

Dr. CLARKE concurred in the opinion that Dr. Byrne had expressed. For a potential pool of teachers when the need is 30-40 per year it would be uneconomical to have two preparatory centres.

Dr. FINN pointed out that the present program offered in Calgary is quite expensive. It means keeping a top man in each area available for the unit shop instruction.

Mr. JORGENSEN felt that until the enrolment figures were more definite he could make little estimate of the effect.

Dr. COUTTS wondered if it would be advisable to have the Board of Teacher Education and Certification or a smaller group consider this.

Mr. McDOUGALL pointed out that a consideration in Calgary's favor is the closeness between the institutions.

Dr. FINN felt that if any change is to be made in our industrial arts program for 1963-64 it should be done soon. The Institute of Technology must make plans for its fall session and have staff available.

Dr. BAKER assumed that we will have to move very quickly on this.

- 18 -

Special Services in Vocational Education - Diploma in Vocational Guidance

Mr. MITCHELL informed the group that permission has been given to operate a vocational guidance program on the same terms as the vocational teacher program. Boards will subsidize candidates. The University is prepared to proceed on this basis. The limit will be 20 students.

The DEAN thanks the members for coming to this meeting. It has given a clearer indication of the direction in which we might move. The details could be worked out and examined as quickly as possible. The Specialist Council the A.T.A. might give some thought to this whole problem. The Curriculum Branch continued to look at this from the stand point of the schools. The Faculty must act immediately to have teachers ready to man the schools.

The meeting adjourned.

----- oOo -----

Following the meeting Dean Coutts, Dean Baker, and Dr. Finn met to discuss procedure for 1963-64. It was agreed that for this one further year the present first year program should be offered in Calgary and the alternate first year program in Edmonton. Both would lead to a common second year. The third and fourth years could follow several patterns. The proposed program, not including the vocational teacher programs, follows.

Functional Objectives of Secondary Education - 1964

It is important that instructors of industrial arts visualize their role as a part of general education. To facilitate this the functional objectives of secondary education in the Province of Alberta are included below.

1. Personal Development

The prime aim of the school is to assist each Alberta youth in his growth towards maximum self-realization. Definite goals of physical fitness, mental health, and intellectual achievement are included under this heading.

- (a) ability to think rationally, to express thought clearly and to read and listen with understanding.
- (b) a broad understanding of the methods of science, its major findings and its influence on human affairs.
- (c) a broad understanding of the fundamental principles of mathematics and their importance in daily living; a mastery of mathematical skills necessary for vocational competence.
- (d) an understanding and appreciation of cultural heritage.
- (e) the development of suitable recreational and leisure-time activities.
- (f) the development of character manifested in sound habits of behavior in social relationships.
- (g) the development of a pattern of values, attitudes, and ethical ideals which generalize and furnish justification for good habits and culminate in a philosophy of life which recognizes the importance of religion.

2. Growth in Family Living

Each Alberta youth must learn to appreciate the unique and indispensable place in society played by the home and family with specific attention to the influence of the family unit upon right thinking in connection with morals, institutions, and the current issues of democratic living. The school should assist him to achieve a better understanding and appreciation of:

- (a) The responsibilities and privileges of the members of the family group.
- (b) The home as a democratic institution.
- (c) The conditions essential to successful family life.

- (d) The opportunities for enjoyment at home.
- (e) The functions and responsibilities of parents.
- (f) The relationship of the family to its neighbors and the community.

3. Growth Toward Competence in Citizenship

Each Alberta youth must be brought gradually to a realization of his position and responsibilities in the school, community, province, nation, and finally in the community of nations. The school should guide him in:

- (a) Acquiring insight into the historical background of contemporary society.
- (b) Developing competence in meeting, and attempting to solve, public problems and issues which citizens are required to encounter and on which they must take action.
- (c) Developing competence in political action at the school, community, national, and world levels.
- (d) Developing consumer competence.
- (e) Developing democratic attitudes and behavior in all social situations.
- (f) Establishing loyalty to the ideals of democracy and acquiring an appreciation of his community, the province, and the nation.

4. Occupational Preparation

The school must help each Alberta youth to develop those understandings and attitudes that will make him an intelligent and productive participant in economic life; and assist him to develop saleable skills, or prepare him for post-school vocational training. The youth should:

- (a) Become familiar with the range of vocational opportunities open to him.
- (b) Learn how to take full advantage of the school and extra-school guidance services.
- (c) Achieve an acceptance of his own capacities as indicated by professional analysis of interests, socio-economic status, aptitudes, personality, and native intelligence.

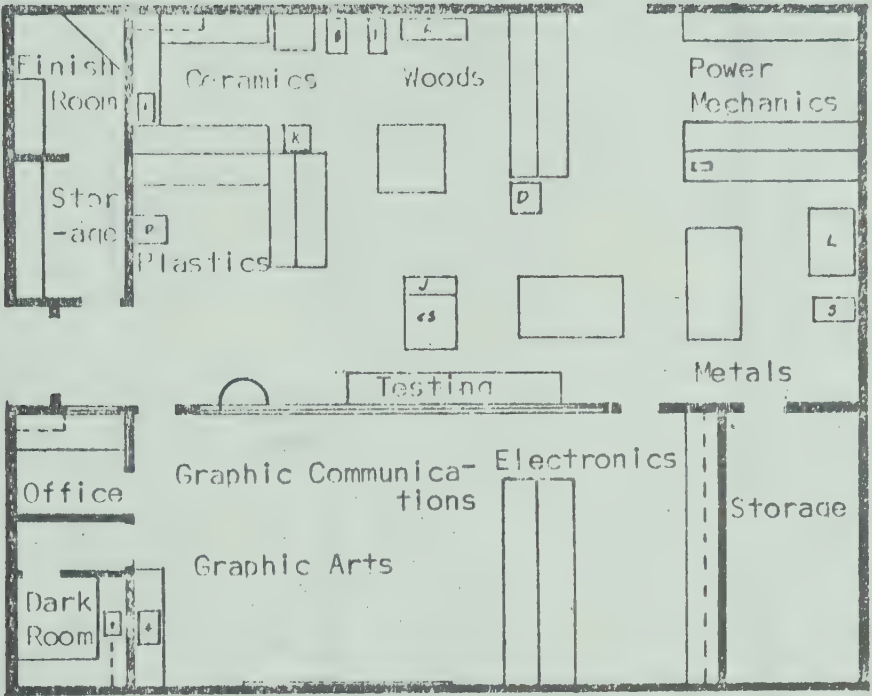


Fig. 6 • Junior High School Industrial Arts Laboratory
3,000 Sq. Ft.

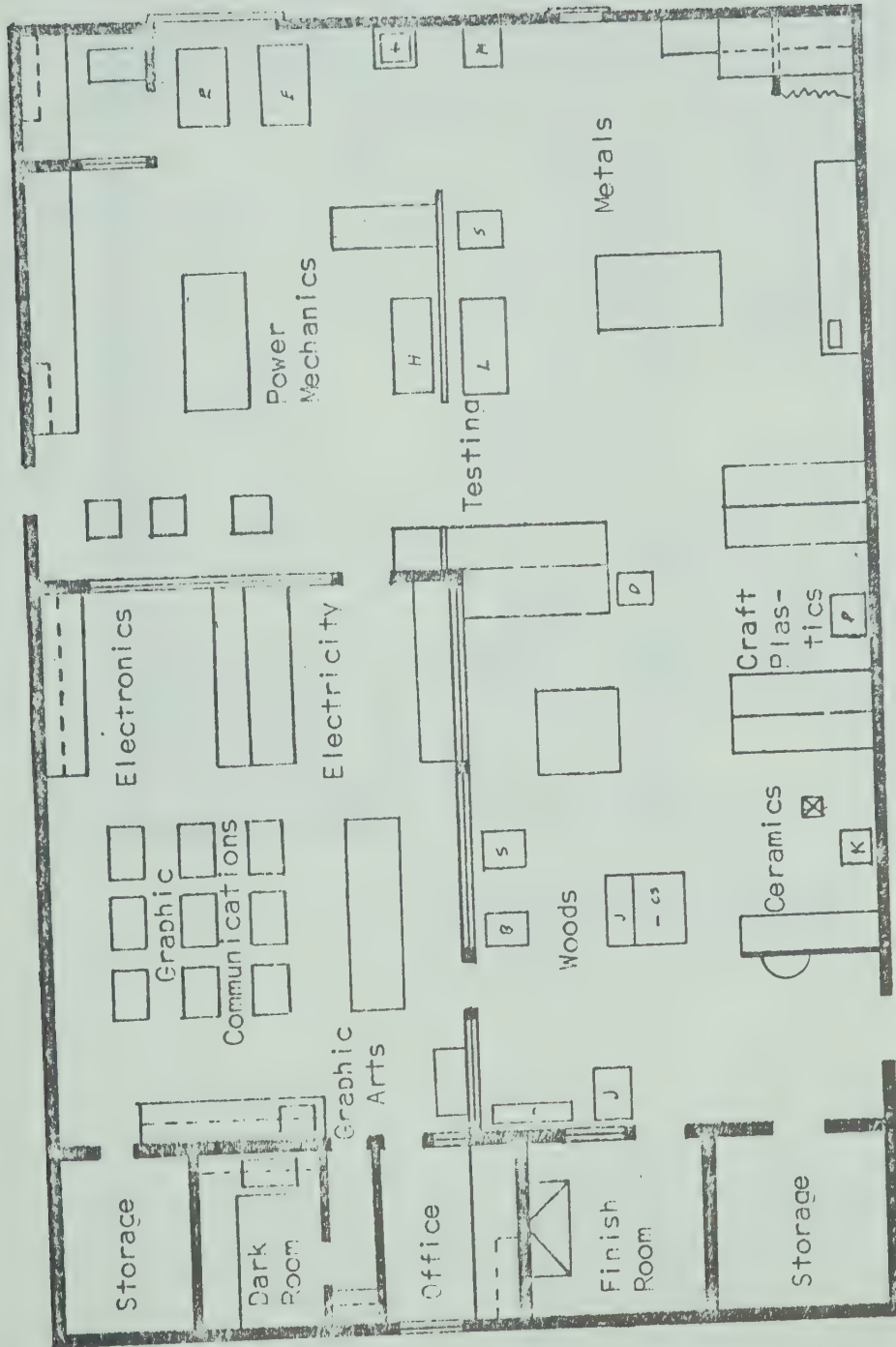


Fig. 9 Junior-Senior High School Industrial Arts Laboratory
3,600 Sq. Ft.

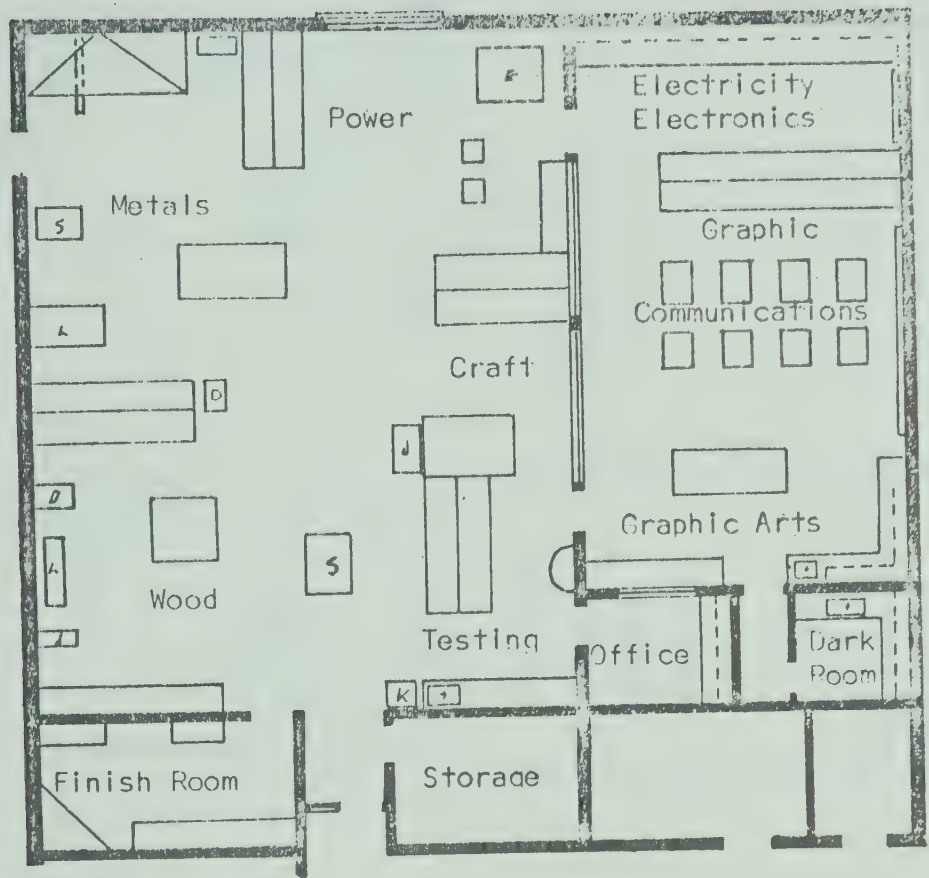


Fig. 10 Junior-Senior High School Industrial Arts Laboratory 3,600 Sq. Ft.

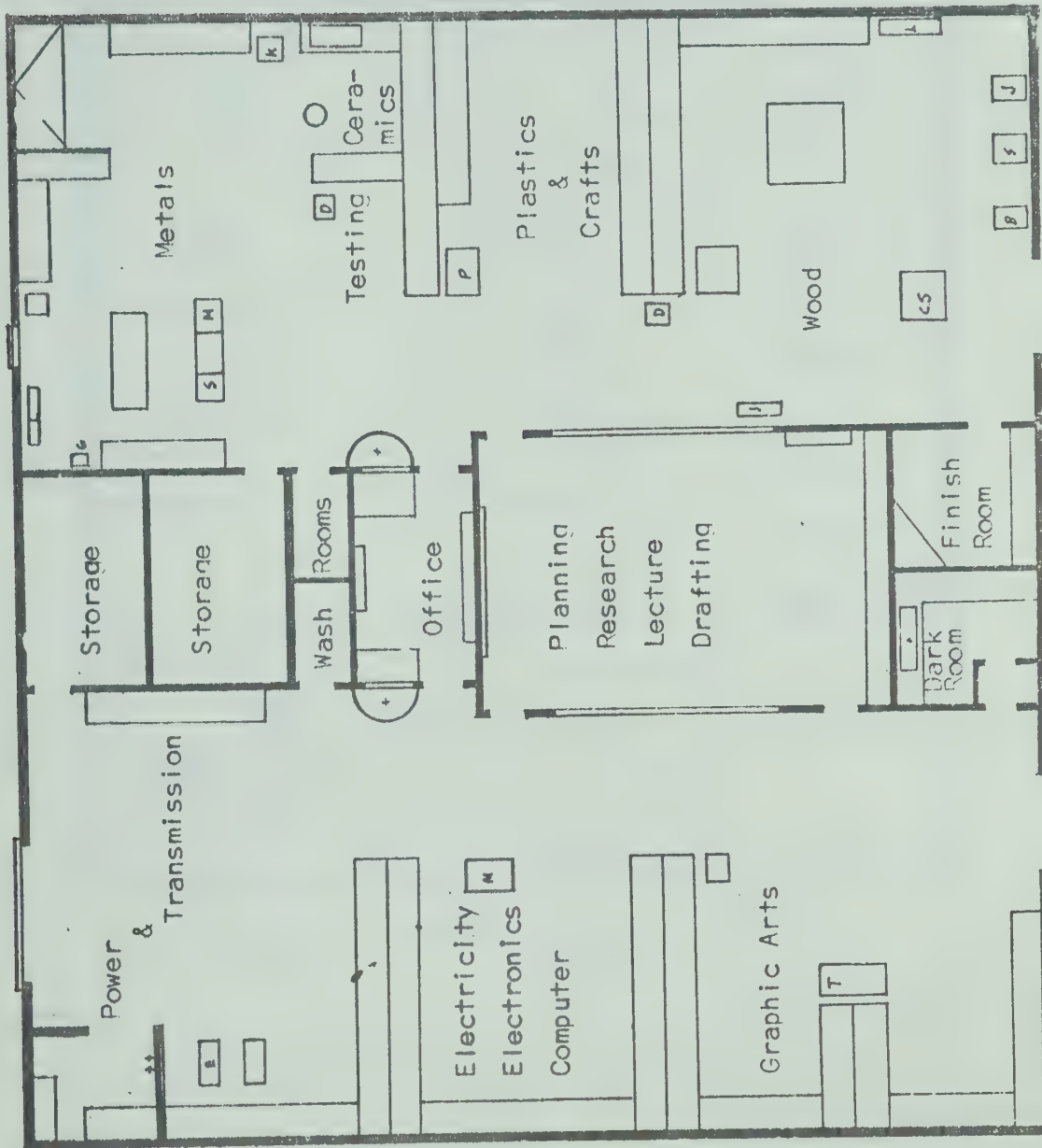


Fig. 11 Two Teacher Industrial Arts Laboratory

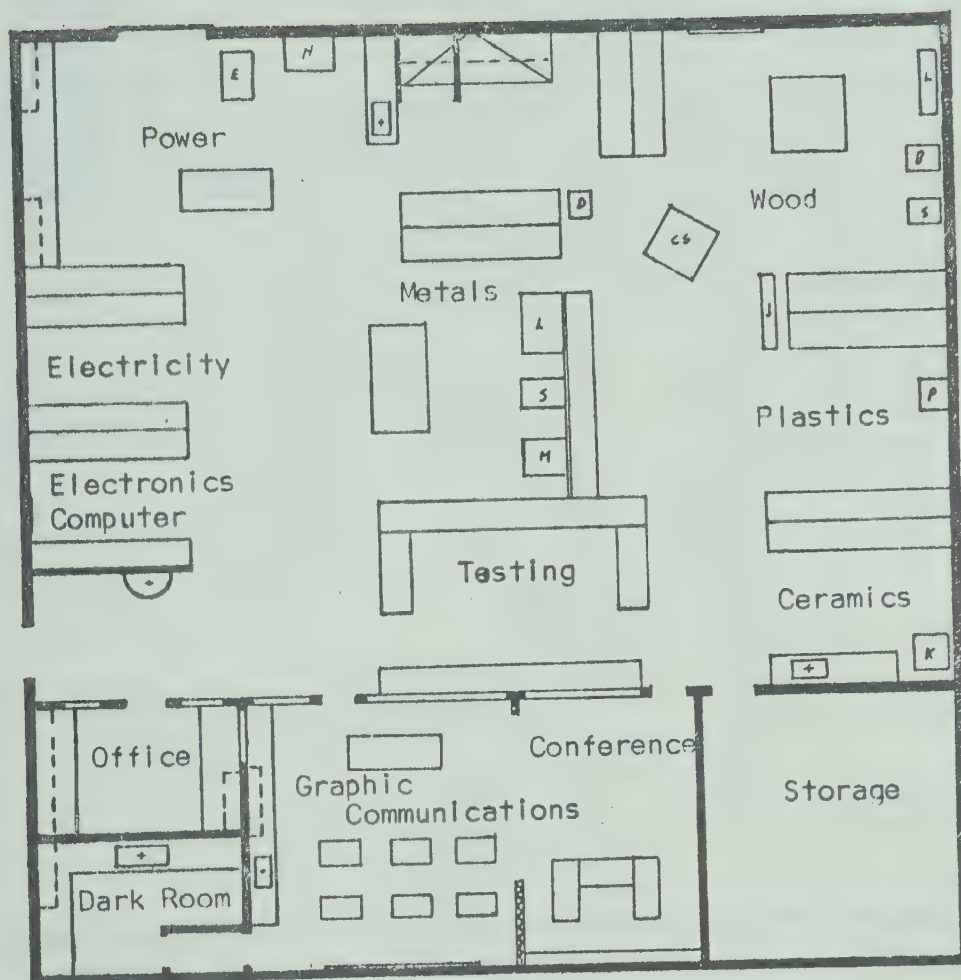


Fig. 12 Two Teacher Industrial Arts Laboratory
4,800 Sq. Ft.

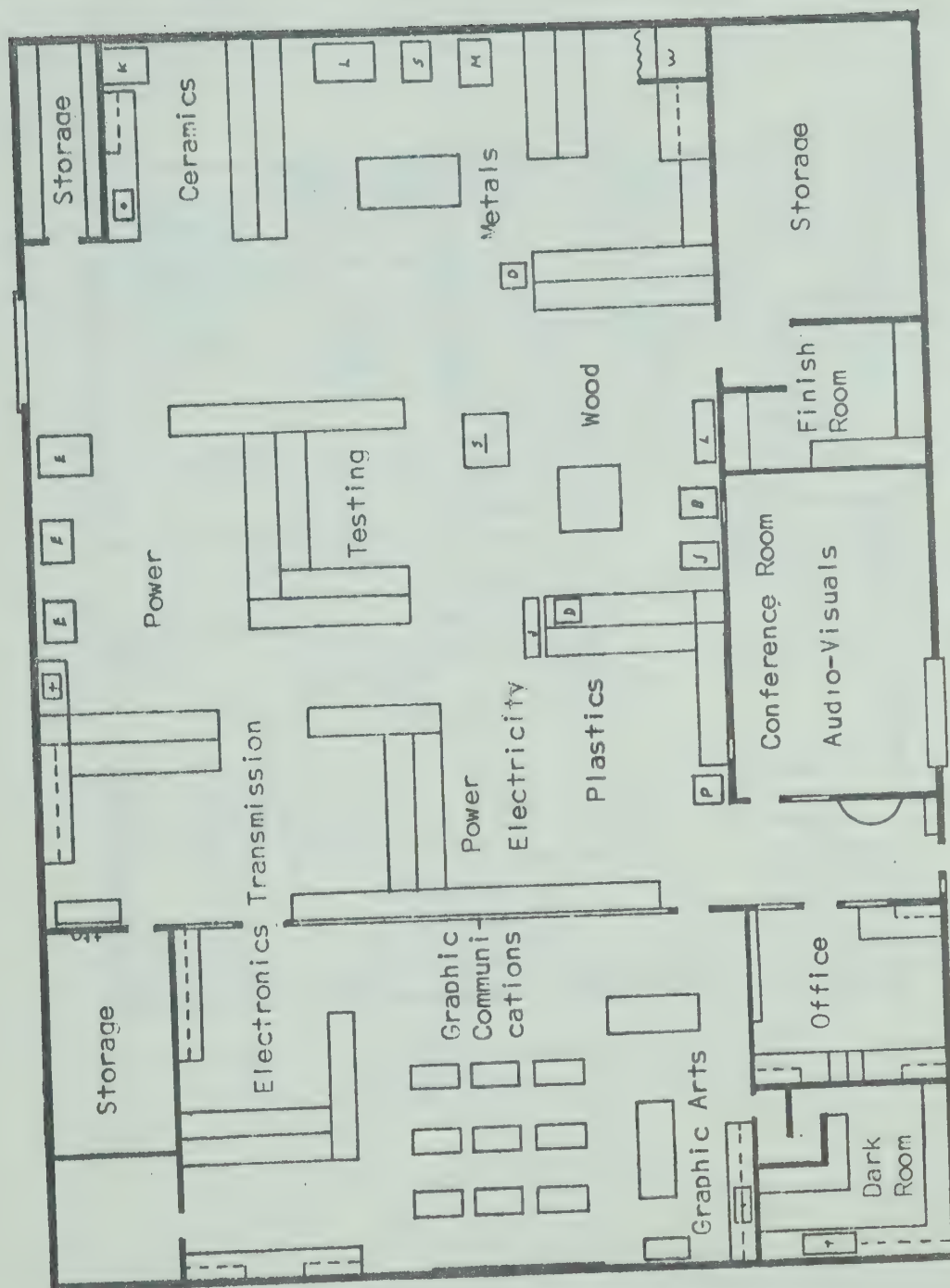


Fig. 13 Three Teacher Industrial Arts Laboratory
7,200 Sq. Ft.

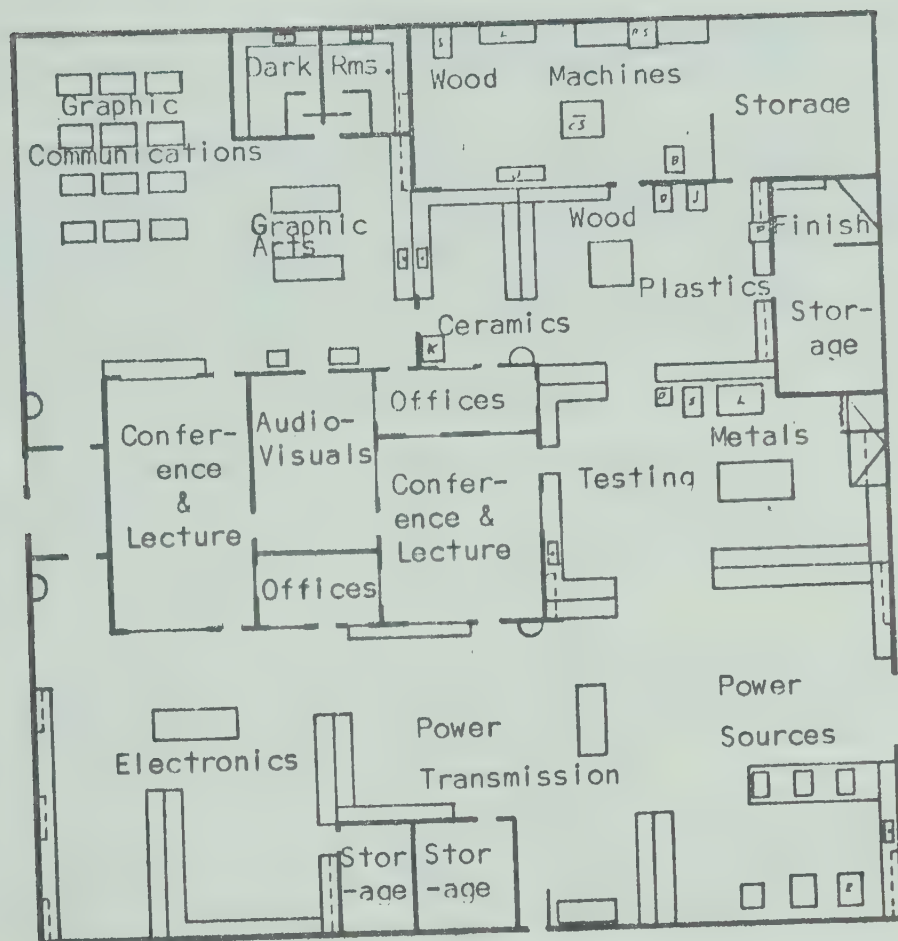


Fig. 14 Four Teacher Industrial Arts Laboratory
9,600 Sq. Ft.

INDUSTRIAL ARTS NEWSLETTER

Volume VI

March, 1967

No. 3

I. PERSPECTIVE

It is five years now that the industrial arts program in this province began to get a shake-up. A review of what has transpired will help us to understand the present status and point up some of the achievements over the past few years.

It was approximately five years ago that Dr. Ziel started getting the fledgling Industrial Arts Teacher Education courses underway. The Department of Education had accepted his basic premises for laying the groundwork for a new program. The Industrial and Vocational Education Department was set up in Edmonton and the first recruits were registered. It was tough going for students and staff alike. New staff had to be brought in, new programs developed for teacher education and facilities and equipment acquired. Courses during the first year were taught in the Hillcrest Junior High School with the majority of the laboratory work carried on after the regular public school children left. These were difficult conditions but moral of the staff and students was high.

The following year two multiple-activity laboratories for I.A. 260 and I.A. 270 were outfitted in the basement at the Northern Alberta Institute of Technology. These provided better accommodation. A third laboratory for I.A. 370 and other third and fourth year courses has been set up at the University this past winter. All of these are temporary accommodations while a permanent facility, which has been approved, awaits construction.

While the courses taught have fluctuated from excellent to mediocre, by student opinion, progress has been made in developing sound basic content. This winter very good work has been done in structuring I.A. 260, I.A. 270 and I.A. 370 in particular. Those of you who have taken these courses and found them wanting will be pleased to see the extent to which they have been improved.

A great deal of criticism has been leveled at the course content or the teaching methods used and perhaps justly. However, let us be aware that these are courses in our program and that collectively we have a responsibility to suggest constructive ideas so that the program may develop into a strong one.

Dr. Ziel has done a tremendous job of promoting industrial arts. He has been able to put words on a feeling of many men in the field as to what industrial arts should be and through his enthusiasm and personality has convinced the decision makers of its merits. Let us not kid ourselves, without the cooperation of the top education administrators no program can move.

Other contributions he and his staff have made include:

- provided courses for vocational teachers
- gave the guidance program a boost, and through it, us
- obtained approval for a large industrial arts facility at the University
- introduced the industrial arts program to pre-medical students at the University

-2-

- initiated a Master's degree program in industrial arts
- initiated a Diploma program in industrial arts
- articulated the basic philosophy upon which our revisions in industrial arts have been based.

While the new teacher education program was developing at the University, we at the Department of Education were not idle.

Curriculum committees were appointed in 1963 and have worked continuously since. These committees include teachers, University people and representation from the Department of Education. It includes people who have way out ideas and those that are conservative. Together they study, present, discuss, argue and eventually come to a consensus. The program that developed bears no single man's stamp on it. Some people's ideas may predominate but these too are refined by the group. What the committees have thus far done is embodied in the curriculum guides which the Department of Education has approved. For those that do not know what this means let me clarify:

1. The curriculum subcommittee develops content. This is what you see in the guide.
2. The content is organized in a presentable form and tabled at the curriculum committee meetings (junior or senior). This committee has representatives from the University, A.T.A., A.S.T.A., Home and School and the Department of Education.
3. Upon their approval the Director of Curriculum legalizes it by obtaining the proper signatures.

Changes can and sometimes are made at the various levels as the courses are reviewed by the different committees.

Curriculum guides have been prepared for both junior and senior high school courses. These are under constant scrutiny and revisions and refinements are made as they are justified. You can make your ideas felt by submitting them in writing to my office and they will be presented to the committee, or you can work through the specialist council.

Major changes that have been approved and are being implemented by the Department of Education are:

1. The multiple-activity concept of organization has been accepted.
2. Many new areas for exploration have been added and the old ones revised and this revision is continuing yearly.
3. The high school courses have been developed into two programs; the Industrial Arts General and the Industrial Arts Cluster series.
4. New equipment lists have been prepared in keeping with the requirements of the curriculum.

-3-

5. Increased laboratory areas have been approved.
6. Laboratory layouts and design are undergoing constant refinement.
7. Some textbooks have been approved at the junior high school level.
8. Student work books or manuals are being developed in the major units of the junior high.
9. An Assistant Supervisor of Industrial Arts (Mr. A. A. Day), has been appointed.
10. Closer liaison has been established between the University and the Department of Education by having the two staffs meeting jointly every month. This means the staffs in Industrial Arts of the respective departments.
11. We have been active in helping school boards and teachers plan the transition from the old to the new program. This not only includes laboratory organization but working with the specialist council in implementing workshops and institutes to upgrade the teacher.

In the last three years sixty-five laboratories have been built or renovated. Last year there were fifty-one industrial arts projects under construction. Since July, thirty-six approvals for industrial arts laboratories have been granted. This has been about one each week.

In addition to the facilities, equipment is being purchased for new areas of study in practically every laboratory in the province.

The new program has been widely accepted by parents, school boards and administrators. Literally speaking we have a bull by the horns and we just better ride him. Now is the time to capitalize on the progress made by:

1. Getting your local program functioning smoothly by good planning and organization.
2. Taking part in summer schools, workshops and conferences related to your field.
3. Supporting your regional specialist council and making it an instrument for collective action.
4. Cooperate with the guidance men in the school so that they are better able to provide information to the students they contact.
5. Alert students who may be potential industrial arts teachers to the opportunities and challenge of this vocation.
6. Send in your ideas or criticisms so that we can act on them.

We are getting action and, like a rapidly moving machine needs grease, we need your ideas - and let's not throw in a hand full of gravel.

Brief to the Faculty of Education, University of Alberta

Of particular interest to industrial arts teachers is that part of the announcement which states that the Faculty of Education will offer training for teachers in all branches of education. This being true, it naturally follows that here again Alberta will lead the field, since at present no teacher-training institution in Canada offers degree work in industrial arts education. Every industrial arts teacher in Alberta will immediately see in this the answer to a question of long standing. At last a program of industrial arts education, leading to a degree, is to be instituted in Canada with Alberta taking the initiative.

It should be noted here that an unfortunate situation has existed in the past as regards the existence or non-existence of teacher training facilities leading to degree work in this province. This department has not kept pace with advances made in industrial arts in our schools. Alberta's industrial arts instructors have had two avenues open to them. On the one hand are the American institutions offering degree work in industrial arts education, while on the other hand we have had the summer school courses in Alberta leading to certification but carrying no degree credits.

Several of Alberta's industrial arts instructors have already obtained degrees in industrial arts education. Surely it is a deplorable fact that these men have had to travel such distances beyond the borders of our own country, at great personal expense to find what they have required in order to win their degrees. This exodus to the United States has been going on for a period of possibly fifteen to twenty years. Numbered among these men who have completed their courses are graduates of Stout Institute, Bradley Polytechnic Institute, Colorado State College, Oregon State College, the University of Minnesota, and others, all highly regarded and thoroughly accredited institutions.

1945 may well bring to an end the long standing necessity for our industrial arts men to leave the province to earn credits in their chosen field of endeavour, during the summer school period. The summer of 1944 saw all teacher-training courses, with the exception of the industrial arts, under the hand of the university. It is our earnest hope therefore that the Director of Summer School for 1945 will include in his announcement something for everyone.

Quite certainly, many industrial arts instructors who are already laying plans to join the annual exodus to the United States will consider carefully the advisability of remaining at home, providing of course that equal credit may be gained in Alberta for equal work done. The very considerable saving in costs of travel and high costs of living, together with the avoidance of the difficulties involved in arranging travel due to war-time restrictions will also have a persuasive effect.

It also occurs to us that a university summer school in industrial arts subjects would not only draw a good attendance from our

own province, but would also attract others from our neighboring provinces. These men might well find it to their advantage, for similar reasons, to seek credits in Alberta. As soon as some definite announcement is made by the Director of Summer School, the good word will soon reach those most interested, whether they be in Alberta, Saskatchewan, or British Columbia.

The Department of Education Summer School in General Shop subjects has filled a need, to a certain point. Teachers who expect to handle shop work successfully must develop in themselves a very considerable amount of the skills required in the various phases of a general industrial arts program in the schools. It should be stated that the shop courses as a whole, as offered in the Summer School in Alberta especially in recent years, have been on a par with, and in some cases superior to, shop courses offered elsewhere. The instructors have been well qualified and have produced very fine results. In addition much valuable work has been done in the related theory as carried on in the seminars accompanying the actual shop courses, insofar as time and facilities would permit. Of course the actual subjects in the theory of industrial arts education have not been included in the set-up to date.

The valuable contribution of the summer school in shop subjects supported by the Department of Education is acknowledged. That the Department has carried on during the last three years especially, in the face of a steadily falling attendance indicates the importance which it attaches to the work. The expense has been very great which fact has been lost sight of at times by those in attendance. Right thinking people must acknowledge too from a strictly financial standpoint, that it has been a losing proposition. Where the Department might have seen fit to close up shop in this department of the summer school it has staunchly carried on.

However, we find ourselves faced with the unfortunate situation referred to above. The decreasing attendance at the Alberta summer school in shop subjects is not altogether attributed to the influence of the demands of war. On the other hand it must be submitted that the one major influence lies very definitely in the question of credits for time spent and work done. Those who have been able to make the required arrangements, financial and otherwise, to attend American institutions are slowly but steadily adding up their credits towards that important B.Sc. or B.Ed. Those who have remained at home for summer school work find themselves at a very considerable disadvantage. The call goes out for higher and higher professional qualifications pointing to the day when all teachers will of necessity hold degrees. The picture is crystal clear. If industrial arts is an integral part of modern education those who engage in its teaching must receive appropriate recognition for time and energies expended in qualifying themselves to handle the work. It is heartening to know that thought is being given to the matter. The hope is expressed here that definite action will come as a result of careful thought.

TABLE VI

QUALIFICATIONS OF TEACHERS IN ALBERTA

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Professional (Grades I-XII)	3,476	4,090	4,822	5,565	6,240	7,592	8,459	9,790	11,507	12,921
Standard 6 (Grades I-IX)	1,171	1,333	1,771	1,573	1,556	1,750	1,901	2,032	1,933	1,703
Standard E (Grades I-IX)	976	1,103	1,267	1,632	1,801	2,394	2,869	3,351	3,437	3,230
Standard E & S (Grades I-XII; replacing permit first class certificate)	683	614	650	626	562	629	585	559	517	420
Junior E (Grades I-IX)	4,039	4,079	4,140	3,869	3,518	3,470	3,272	3,295	3,126	2,862
Letter of Authority	1,011	1,027	972	955	991	1,148	1,146	1,013	761	335
High School (Grades VII-XII)	190	187	174	164	168	166	154	144	136	123
Academic (Grades I-XII)	39	28	33	23	17	15	12	11	10	3
First Class (Grades I-XII)	645	598	591	535	492	456	409	384	332	277
E and i (Grades I-X)	916	855	850	784	687	725	671	606	565	515
Second Class (Grades I-IX)	498	461	427	413	332	398	360	345	314	264
Junior High School	1	1				15	20			
Provisional									3	100
Conditional									75	102
Others			50					47	10	15
	13,651	14,376	15,747	16,139	16,364	18,758	19,858	21,577	22,726	22,870

TABLE VII

DEGREE STATUS OF INDUSTRIAL ARTS TEACHERS 1962-1971

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
B. Ed.	57	63	63	109	123	140	144	1157	177	
B. Sc.	11	13	13	29	35	45	38	39	48	247*
B. A.	5	5	5	10	14	16	16	18	18	
B. S. A.		1	1	1	2	1	1			
M. A.	3	1	1	4	4	3	3			
M. Ed.	7	7	7	6	8	5	5	14*	10*	12*
M. Sc.	2			3	3	3	3			
Others				1	1	1	1	2	1	
Ratio of Degrees/Teacher	85/288	45/137	18/59	163/273	191/333	214/347	211/303	115/169	127/187	
Total Teachers**	288	274	295	273	333	347	303	338	386	408

*No distinction was made as to what type of Bachelor's degree or Master's degree these figures were.

**Some teachers have more than one degree; thus, the figures do not add up to equal total teachers.

TABLE VIII

JUNIOR-SENIOR HIGH SHOP ENROLLMENTS 1950-1971

	1950	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
I.A. Jr. High Population	8,893	18,400	20,115	20,308	19,302	18,274	21,700	23,357	24,853	26,662	28,702	30,845	32,397
Total Jr. High Population	38,391	67,403	73,208	76,173	77,764	80,023	83,795	88,233	92,256	96,066	99,329	102,397	105,537
% Jr. High in I.A.	23.2	27.3	27.5	26.7	24.8	22.8	25.9	26.5	26.9	27.8	28.9	30.1	30.7
I.A. Sr. High Population	3,121	7,638	8,435	9,883	10,557	7,135	6,904	8,107	7,737	9,192	8,531	10,079	8,614
Total Sr. High Population	21,125	48,212	43,341	47,870	52,088	57,501	62,489	64,851	67,579	72,469	79,727	85,186	90,022
% Sr. High in I.A.	14.8	15.8	19.5	20.6	20.3	12.4	11.0	12.5	11.4	12.7	10.7	11.8	9.6
I.A. Jr.-Sr. High Population	12,014	26,038	28,550	30,191	29,859	25,409	28,604	31,464	32,590	35,854	37,233	40,924	40,911
Total Jr.-Sr. High Population	59,516	115,615	116,549	124,043	129,852	137,524	146,284	153,084	159,835	168,535	179,054	197,583	195,559
% Jr.-Sr. High in I.A.	20.2	22.5	24.5	24.3	23.0	18.5	19.6	20.6	20.4	21.3	20.8	10.7	20.9

TABLE IX

STUDENT ENROLLMENTS 1962-1971

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
SCHOOL POPULATION	312,684	322,227	336,652	350,906	362,158	372,893	385,972	401,587	413,719	423,964
Jr. High Population	76,173	77,764	80,023	83,795	88,233	92,256	96,066	99,329	102,397	105,537
Sr. High Population	47,870	52,088	57,501	62,489	64,851	67,579	72,469	79,727	85,186	90,022
Jr.-Sr. High Population	124,043	129,852	137,524	146,284	153,084	159,835	168,535	179,054	187,583	195,559
I.A. Jr. High Population	20,308	19,302	18,274	21,700	23,357	24,853	26,662	28,702	30,845	32,297
I.A. Sr. High Population	9,883	10,557	7,135	6,904	8,107	7,737	9,192	8,531	10,079	8,614
TOTAL I.A. POPULATION	30,191	29,859	25,409	28,604	31,464	32,590	35,854	37,233	40,924	40,911
No. Boys in Jr.-Sr. High	62,945	66,232	83,003	74,741	78,243	81,790	86,309	92,120	96,659	101,071
No. Girls in Jr.-Sr. High	60,098	63,620	67,382	71,642	74,841	78,045	82,226	86,934	90,924	94,488

TABLE X

CONTRAST OF INDUSTRIAL ARTS & ACADEMIC ENROLLMENTS 1962-1971

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Total School Enrollment	312,684	322,227	336,652	350,906	362,158	372,893	385,972	401,587	413,719	423,964
Number of Schools In Operation	1,416	1,377	1,350	1,340	1,376	1,385	1,388	1,400	1,366	1,392
Total Number of Teachers	13,342	14,376	15,747	16,139	16,364	18,758	19,858	21,577	22,726	22,870
Total I.A. Enrollment	30,191	29,859	25,409	28,604	31,464	32,590	35,854	37,233	40,924	40,911
Number of I.A. Shops In Operation	311	306	309	288	324	293	307	341	383	397
Total Number I.A. Teachers	288	274	295	273	333	347	303	338	386	408

TABLE XI

NUMBER OF SHOPS OPERATING, OPENED, ADDED TO, REOPENED AND CLOSED 1962-1971

Year	No. of shops operating	Shops opened	Shop additions	Shops reopened	Shops closed*
1962	311	15		3	11
1963	306	9	2	3	
1964	309	10	7	5	6
1965	288	13	1	3	3
1966	324	22	2	4	7
1967	293	44	7	7	5
1968	307	25	4	5	20
1969	341	40	5	4	20
1970	383				
1971	397				19**

*These are schools which have been closed for the first time this year.

**These are schools which have been closed for the first time or those which are remaining closed this year.

B30050